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BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 15 1941

THE EFFECT OF PERITONEAL IRRITATION ON THE ACTIVITY OF THE INTESTINE

BY

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The management of abdominal distension occurring in the course of diffuse peritonitis is still a major surgical problem. Two principal views are widely held concerning the pathogenesis of the condition, the one contending that the distension is the result of multiple adhesive obstructions in the intestine, and the other that the activity of the intestine is reflexly inhibited by reason of the peritoneal irritation. The views might reasonably be termed respectively "mechanical" and "neurogenic." These two concepts are of more than academic interest, since the mode of treatment, operative or conservative, is influenced by the view held by the individual surgeon. There are, of course, cases in which the obstructive element is quite obvious. The patient who is suffering from painful attacks of colic and in whom peristalsis is audible often even without the use of a stethoscope is evidently not suffering from inhibition of intestinal activity. But it must be confessed that such cases are less common than those in which little evidence of intestinal activity can be detected.

The purpose of this paper is to present some observations on the effect of peritoneal irritation on the activity of the intestine. It is apparent that, in order to study reflex phenomena adequately, it is necessary in some way to separate the receptor and the effector elements in the hypothetical reflex arc. In other words, if equivocal results are to be avoided the adequate stimulus must be delivered at a site remote from that in which the reflex effect is to be studied. It was by the application of this principle that Pavlov was enabled to study the various phases of gastric secretion. The pouch which bears his name was so devised that he could collect samples of gastric juice from a portion of the stomach which, while retaining its nerve supply, was completely cut off from the adequate stimulus, which was the entry of food into the remainder of the stomach.

We endeavoured to find a method whereby this principle could be applied to the study of paralytic ileus; in other words, we wished to devise a preparation which would permit of the production of diffuse peritoneal irritation without at the same time producing local peritonitis of the intestine in which the reflex effect of the peritoneal irritation was to be expected. We believed that any effect which might be observed could, if time relations were compatible, be reasonably regarded as reflex in character, and would be a suitable phenomenon for the study of mediation of inhibition in the intestine in response to peritoneal irritation.

A complete review of the literature which has accumulated, particularly on the clinical side of this field, would be outside the scope of a communication of this type. Accordingly, it is proposed to refer only to the more important papers in the experimental field on which the neurogenic concept of paralytic ileus is based. Van Braam Houckgeest in 1872 made the observation that abdominal section and exposure of the intestines had an inhibitory effect on intestinal activity. It was not till 1899 that Bayliss and Starling found that this inhibition could be overcome after a short latent period by section of the splanchnic nerves. Cannon and Murphy (1907) showed that a similar type of intestinal inhibition could be caused in cats by local trauma to the intestines or reflexly by trauma to the testes, and, similarly, that this inhibition could be prevented by previous splanchnicotomy. In the rabbit, Melzer and Auer (1907) and Hotz (1909) demonstrated that certain inhibitory intestinal reflexes could be prevented by destruction of the cord to the third dorsal segment or by splanchnic section. Arai (1921) observed intestinal inhibition in cats after the intraperitoneal injection of irritant solutions, and King (1924) demonstrated similar inhibition in dogs from stimulation of bladder, rectum, peritoneum, and various skin areas. Olivecrona (1926–7) concluded that, in the cat, local reflexes mediated by way of the coeliac ganglia were capable of causing intestinal inhibition. Markowitz and Campbell (1927) and Ochsner, Gage, and Cutting (1928) showed that the inhibition of peritonitis in dogs could be prevented by spinal or splanchnic anaesthesia. Alvarez and Hosoi (1929) suggested that in the ileus of peritonitis a flattening of the normal gradient of forces occurred. Demel (1926) reported that atony of the bowel of the dog could be produced by retroperitoneal injection of blood. The recent work of Youmans, Herrin, and Meek (1938) suggests that distension of one part of the intestine causes inhibition of other parts.

Experimental Methods

Three main problems confronted us at the outset of this study. The first has already been referred to—namely, the devising of a suitable preparation. The second was the difficulty of finding a standard by which

inhibition of intestinal activity could be judged; the third was the choice of a method for the production of peritoneal irritation.

The first problem was solved by means of the preparation described by Biebl (1930) for the collection of samples of intestinal contents and used later by Castleton (1934) and Wangensteen (1937). It consists of an exteriorized loop of intestine, in continuity, with extrinsic nerve and blood supply intact, enclosed in a bipedicled tube of skin exactly similar to that used in plastic surgery (Fig. 1). The parietal and visceral peritoneum at the

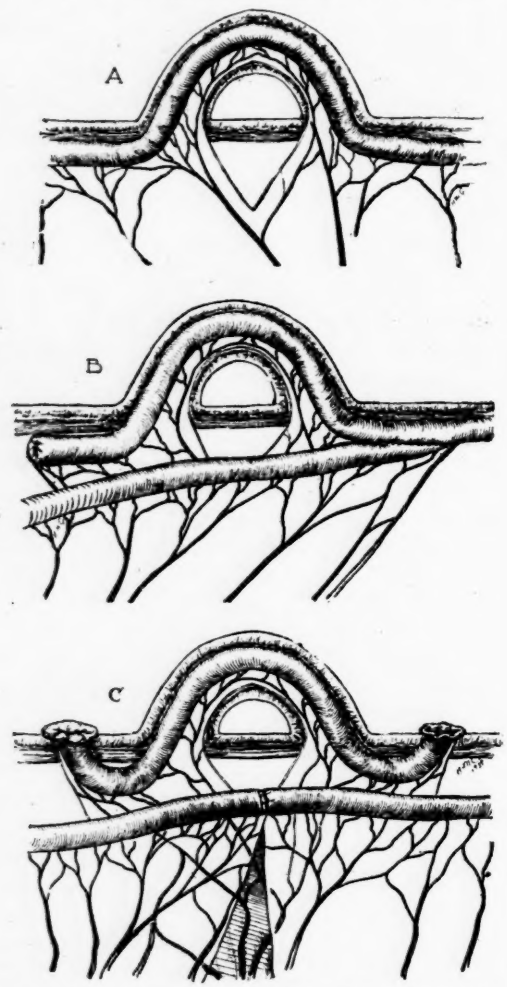

FIG. 1.—Types of exteriorized loops of intestine enclosed in bipedicled skin tubes. A: In continuity as used in the present study. B: Short-circuited. C: Isolated—analogous to the Thiry-Vella loop.

exit and entrance of the loop from the peritoneal cavity become firmly adherent to each other and so effectively seal off the whole loop from the peritoneal cavity, while the lumen of the bowel, exactly comparable to a colostomy loop before opening, remains patent. By virtue of the exteriorized position of the loop and of the effective sealing off of its visceral peritoneal surface from the general peritoneal cavity it is possible to set up an inflammatory process within the latter without in any way directly affecting the former. The operative procedure involved in the preparation of these loops is simple, the operative mortality is low, and the animals can be observed in good health for many months. The advantages and disadvantages of the preparation have been discussed in a previous communication (Douglas and Mann, 1939). For the present purpose the advantages appeared to outweigh the disadvantages.

As to the second problem, it requires only a cursory glance at the literature to realize that no accurate concept exists as to what constitutes inhibition of intestinal activity. One of the main causes of this confusion appears to lie in the fact that a great diversity of methods have been used to study intestinal activity. Thus workers with an intraluminal technique naturally tend to regard inhibition in terms of tonus; workers using enterographic methods lay stress on diminution of amplitude and rate of contraction; and those using radiographic technique speak in terms of the progress of food residues. Since coincident with a fall in tonus there may be an increase in the amplitude and rate of contraction, and vice versa, it is easy to see how conflicting results may arise. In order to avoid confusion of this type the term "inhibition of intestinal activity" in the present study has been taken to mean absolute quiescence of the intestine—that is, where neither by the recording technique nor visually could any movement whatever be observed. Inhibition was considered to have come to an end when the first contraction, however small, reappeared. Thus it was possible with some degree of accuracy to measure quantitatively the duration of inhibition.

In the production of peritoneal irritation the intraperitoneal injection of irritant solutions was adopted for the following reasons: (1) the technique of intraperitoneal injection is a well-standardized procedure, simple of execution, requiring no anaesthesia, and without detrimental effect on the animal; (2) the method has been used extensively in studies of this nature, and the injection of a known quantity of irritant solution is in some respects quantitative and is easily controlled by the injection of bland non-irritant solutions; (3) the injection is in the nature of a sudden peritoneal insult analogous to the perforation of a hollow viscus, and is therefore well suited to the present study; (4) finally, recovery from the small quantities of irritant solution used was rapid and uneventful.

In view of the species differences which are said to exist with respect to intestinal activity it was thought wise to study two types of animals. The rabbit and the dog were therefore used, and, in order to have data on the small and large intestine, loops were prepared from the caecum of the rabbit and the ileum of the dog. Records of intestinal activity were taken in the rabbit by an enterographic method and in the dog by a double-tambour air-displacement system (Fig. 2).

Procedure of the Experiments.—The same technique was used throughout. The animal was fed before the experiment to ensure maximum activity of the intestine. It was then placed on an observation table, upon which it had been previously trained to lie. A 20-gauge needle was inserted into the peritoneal cavity and a length of rubber tubing attached to it, secured to the abdominal wall by adhesive tape. A control tracing of intestinal activity was then taken for a period of fifteen minutes. A measured quantity of Ringer-Locke's solution at 39° C. was now injected into the peritoneal cavity and the tracing was continued for thirty minutes. A similar quantity of irritant solution at 39° C. was then injected and the tracing was continued for a period of two to three hours. Since the tracing was taken continuously throughout the whole of the experiment it was possible to record the reaction of the exteriorized loop of intestine to the intraperitoneal irritative process. In no instance did the injection of Ringer-Locke solution have any effect on the intestinal activity.

Preparations.—Experiments were carried out in the following preparations: (1) the normal animal; (2) the animal with bilateral splanchnic section; (3) the animal with bilateral vagal section; (4) the animal with unilateral splanchnic section; (5) the animal with bilateral adrenal-

ectomy. The splanchnic nerves were severed through a lumbar approach, the vagi through a thoracic approach immediately above the oesophageal hiatus in the diaphragm. No experiments were carried out after the nerve sections until a period of at least three weeks had elapsed. This was to allow of degenerative processes in the synaptic connexions which these nerves make in the myenteric plexus. The adrenalectomized animal was given a daily maintenance dose of adrenal cortical extract and a diet low in potassium. Both the animals with nerve sections and the adrenalectomized animal maintained good health and, so far as could be judged by bowel habits and tracings of intestinal activity, showed no deviation from the normal in respect of the alimentary canal. This is in accordance with the findings of other observers.

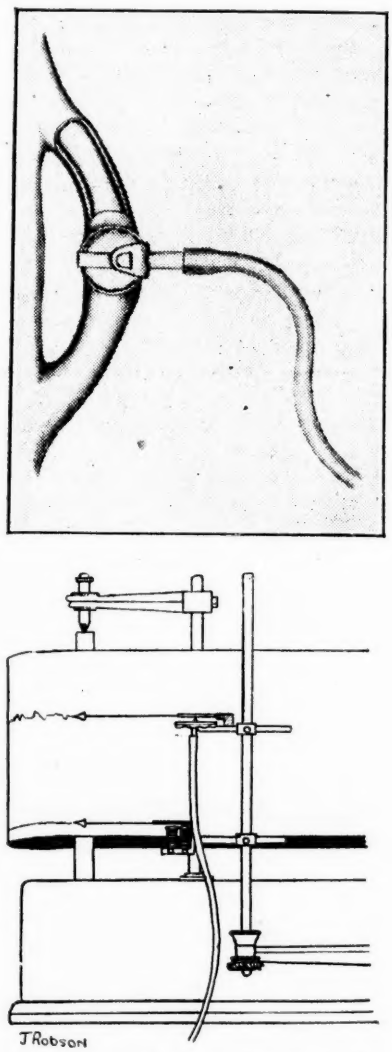

FIG. 2.—Simple air-displacement system. The receiving tambour is attached to the intestinal loop by an inelastic aluminium clip.

Results

THE RABBIT

The Normal Rabbit.—Eleven experiments were carried out in the normal rabbit. In all of them immediate and prolonged inhibition of the movements of the loop was observed in response to the intraperitoneal injection of a small amount of irritant solution (Table I). The nature of the irritant solution did not appear to be of importance, since sodium ricinoleate solution, turpentine emulsion, and Lugol's iodine solution produced a similar result.

TABLE I.—*Effect of Intraperitoneal Injection of Irritant Solution on the Activity of the Intestine of the Rabbit*

Animal	Irritant	Quantity in c.cm.	Dilution	Inhibition	Duration in Mins.
	Normal Rabbit :				
1	Sodium ricinoleate	5	1 : 50	+	120
2	Lugol's solution	3	1 : 10	+	35
3	Turpentine	2	1 : 20	+	108
4	Lugol's solution	2	1 : 10	+	30
5	,,	2	1 : 10	+	48
6	,,	3	1 : 10	+	47
7	,,	3	1 : 10	+	62
8	,,	2	1 : 10	+	40
9	,,	2	1 : 10	+	32
10	,,	3	1 : 10	+	45
11	,,	2	1 : 10	+	33
	Splanchnicotomized Rabbit :				
12	Lugol's solution	3	1 : 10	Nil	
13	,,	3	1 : 10	,,	
14	,,	3	1 : 10	,,	
15	,,	3	1 : 10	,,	
16	,,	3	1 : 10	,,	

The Splanchnicotomized Rabbit.—Five experiments were performed in the rabbits which had had both splanchnic nerves previously sectioned. Although these animals showed a similar systemic response to the injection of the irritant, in no case was inhibition of movements of the extraperitoneal loop observed (Table I).

THE DOG

The Normal Dog.—Five experiments were carried out in the normal dog. As in the normal rabbit, immediate and prolonged inhibition of activity in the extraperitoneal loop was observed (Table II and Fig. 3).

TABLE II.—*Effect of Intraperitoneal Injection of Irritant Solution (Lugol's Iodine) on the Activity of the Intestine of the Dog*

Animal	Quan tity in c.cm.	Dilution	Inhibition	Duration in Mins.
	Normal Dog :			
1	4	1 : 2	+	75
2	3	Undiluted	+	240
3	4	1 : 3	+	54
4	4	1 : 3	+	53
5	4	1 : 3	+	94
	Splanchnicotomized Dog :			
6	4	1 : 2	+	1
7	4	1 : 2	Nil	
8	4	1 : 2	+	0.25 (15 sec.)
	Vagotomized Dog :			
9	2	1 : 3	+	75
9	3	1 : 2	+	64
	Unilaterally Splanchnicotomized Dog :			
10	4	1 : 4	+	81
10	3	1 : 4	+	72
	Adrenalectomized Dog :			
11	4	1 : 2	+	32
11	4	1 : 2	+	32
11	4	1 : 2	+	24

The Splanchnicotomized Dog.—Three experiments were carried out in the animals with bilateral splanchnic section (Table II). In one experiment no inhibition was noted in response to the intraperitoneal injection of the irritant solution; in the two others transitory delayed inhibition was noted (Fig. 3). The same experimental manœuvre produced in the normal dog immediate and prolonged inhibition.

The Vagotomized Dog.—Two experiments were carried out in the vagotomized dog. Prolonged inhibition of intestinal activity was observed in both (Table II). The reaction was similar to that seen in the normal dog (Fig. 3).

The Unilaterally Splanchnicotomized Dog.—Two experiments were carried out in the unilaterally splanchnicotomized dog. As in the normal dog and the vagotomized dog, prolonged inhibition of activity in the extraperitoneal loop occurred (Table II and Fig. 4).

The Adrenalectomized Dog.—Three experiments were carried out in the dog which had had both adrenal glands removed three weeks before. In all three experiments a result similar to that seen in the normal dog was noted—namely, immediate and prolonged inhibition of intestinal activity (Table II and Fig. 4).

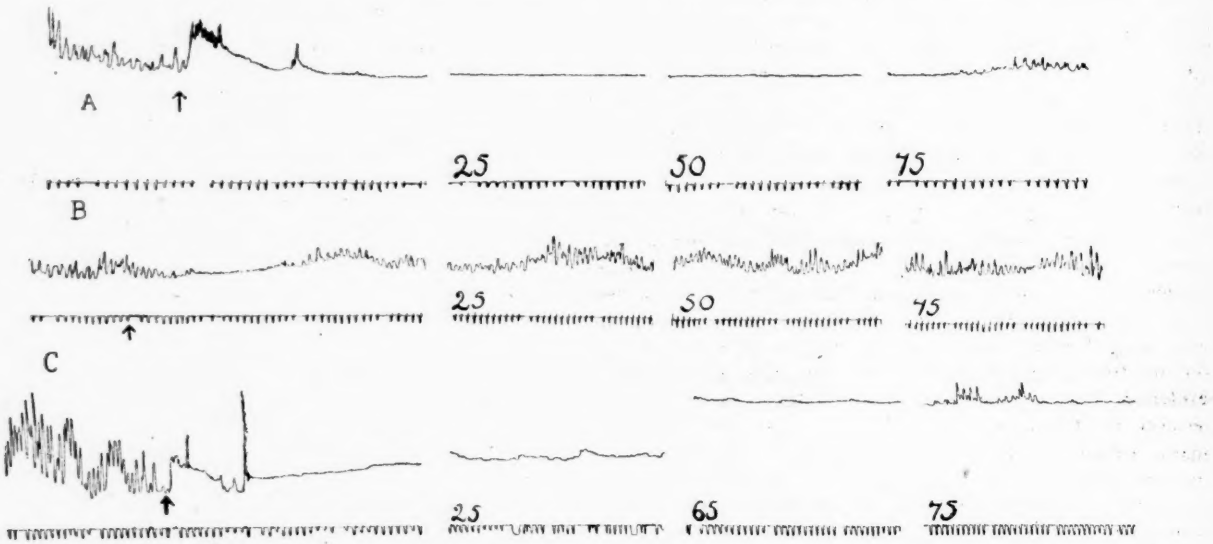

FIG. 3.—Effect of intraperitoneal injection of irritant solution on the activity of the intestine. At arrow, standard quantity of solution injected into peritoneal cavity. Large numbers indicate minutes. Time in 5-second intervals. A: Normal dog. B: Dog with bilateral splanchnic section. C: Dog with bilateral vagal section.

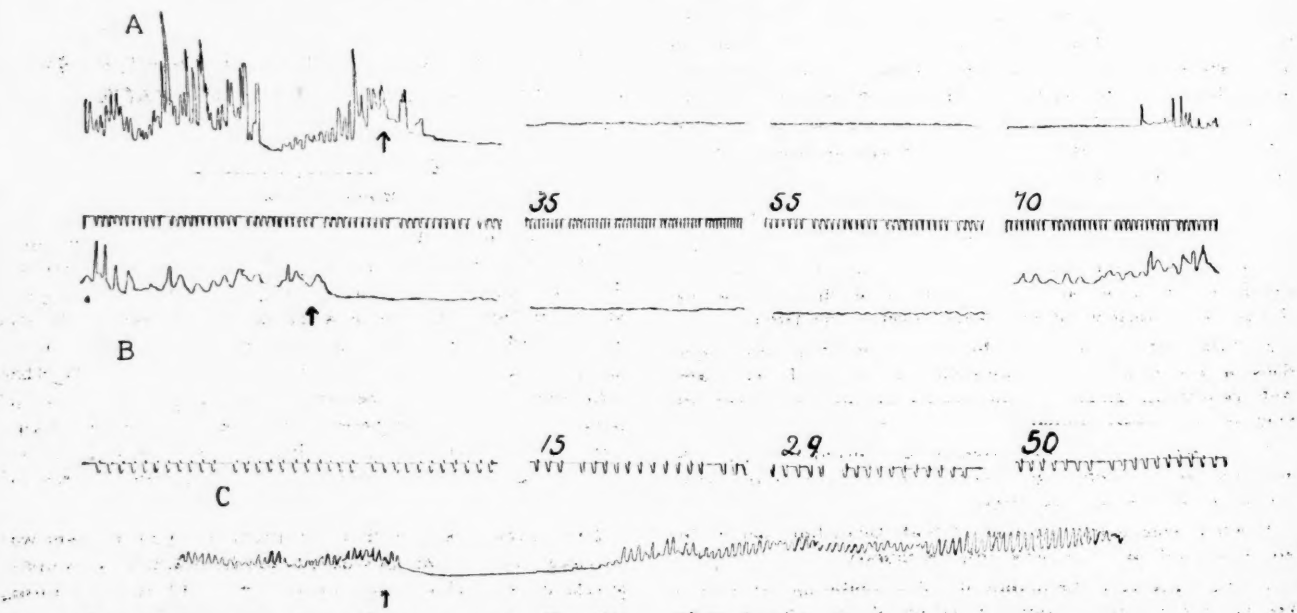

FIG. 4.—Effect of intraperitoneal injection of irritant solution on the activity of the intestine. At arrow, standard quantity of solution injected into the peritoneal cavity. Large numbers indicate minutes. Time in 5-second intervals. A: Dog with unilateral splanchnic section. B: Dog with bilateral adrenalectomy. C: Effect of intravenous injection of 0.25 c.cm. of adrenaline on the activity of the intestine.

Comment

The arrest of intestinal activity consequent on the injection of irritant solutions into the peritoneal cavity noted in this study is in all likelihood true reflex inhibition, since no drugs were used, there was no handling of the bowel, and no foreign bodies were introduced into the bowel. Moreover, the arrest occurred irrespective of the nature of the irritant solution, and no arrest was observed when a non-irritating solution such as Ringer-Locke was used. A direct effect on the bowel could be excluded because of the extraperitoneal situation of the bowel under study.

The experiments after bilateral vagal section indicate that the vagus nerves play little part in mediating the inhibition either as afferents or efferents, since the inhibition is similar to that seen in the normal animal. Similarly, the observations after unilateral splanchnic section indicate that the absence of the splanchnic nerves on one side alone does not prevent the mediation of the inhibition. The experiments after bilateral splanchnicotomy, on the other hand, indicate that the inhibitory process is mediated through the splanchnic nerves, since either no inhibition occurred or, as in two experiments, it was momentary.

It is well known that adrenaline causes inhibition of intestinal activity (Fig. 4). It was with this consideration

in mind that experiments were carried out in the adrenalectomized animal. The inhibition seen in the adrenalectomized animal was similar to that in the normal animal, though of shorter duration. It may be that part of the inhibition observed in the normal animal is mediated by the adrenal medullary principle and that the transient inhibition seen in two experiments in the splanchnicotomized animal was similarly effected.

Olivecrona (1926–7) attempted to draw a distinction between rhythmic and peristaltic activity in respect to their response to peritoneal irritation, indicating that the latter type is very readily inhibited whilst the former persists. An analysis of this type is extremely difficult under reasonably normal experimental conditions, and it was therefore purposely avoided in this study. Since, however, we took absolute quiescence as the criterion of intestinal inhibition the problem did not arise.

We are well aware of the danger of applying experimental observations to clinical problems. Nevertheless it seems of considerable interest that an irritative process within the peritoneal cavity is capable of bringing about a prolonged arrest of activity in intestine which is entirely remote from the peritonitis. We take this as reasonable evidence that the neurogenic or reflex concept of distension in diffuse peritonitis is not the chimera which many authors suggest, particularly when so many cases recover without operative intervention. To enter into a discussion on the virtues of the various lines of treatment would be outside the scope of a paper of this kind, but it is permissible to suggest that enterostomy or enteroanastomosis is not likely to meet with success in cases in which the activity of the intestine is inhibited. We would therefore plead that, in the absence of obvious intestinal activity, there are good grounds for the adoption of conservative measures in the treatment of the distension of peritonitis. Measures calculated to overcome splanchnic inhibition such as splanchnic block or the use of acetylcholine protectives such as prostigmin would appear to be rational therapy.

Summary

1. Extraperitoneal loops of bowel in continuity were prepared in the rabbit and dog. A loop of the caecum was chosen in the former, of the small bowel in the latter.

2. Peritoneal irritation produced by intraperitoneal injections of a standard irritant solution was constantly associated with prolonged arrest of movements in the extraperitoneal loop in the trained animal.

3. The arrest of intestinal movements occurred after degenerative section of both vagus nerves, of one splanchnic nerve, and after bilateral adrenalectomy.

4. After degenerative section of both splanchnic nerves the arrest did not occur or was only temporary.

5. The arrest is in the nature of reflex inhibition, because by reason of the extraperitoneal situation of the loop of bowel the stimulus is delivered to afferents other than those in the loop.

6. The anatomical pathway of the reflex arc is not fully determined.

(*a*) The receptor endings are in the peritoneal cavity, but whether in parietal or visceral peritoneum or both is unknown. Cannon and Alvarez have each found evidence for visceral receptors; Hotz and King have found evidence for parietal receptors.

(*b*) The afferent limb of the arc is similarly unknown. Cerebrospinal afferents from the parietal peritoneum are almost certainly involved.

(*c*) The connector element is made up of the preganglionic neurones of the thoracic outflow which constitute the splanchnic nerves.

(*d*) The efferent limb of the arc is made up of the postganglionic sympathetic neurones issuing from the coeliac plexus.

(*e*) The effector endings are in the extraperitoneal loop of the bowel.

7. In the normal animal it is possible that part of the duration of the inhibition may be mediated by adrenaline, and that in the animal with bilateral degenerative section of the major splanchnic nerves the transitory inhibition noted was similarly mediated.

The findings are taken to indicate that prolonged intestinal inhibition may result reflexly from irritation of the peritoneum, that the inhibition is mediated by the splanchnic nerves, and that there is a sound physiological basis for the neurogenic concept of paralytic ileus.

It is a great pleasure to make acknowledgment to the Commonwealth Fund, New York, and to the Mayo Foundation, Rochester, Minnesota, for their kindness and for the facilities for carrying out this work.

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TREATMENT OF OPEN WOUNDS BY THE SULPHANILAMIDE PACK

BY

A. C. KING, F.R.C.S.
Major, R.A.M.C.

This is an account of a method of treatment for open wounds employed by the surgical specialist to a casualty clearing station during the fighting in France and Belgium which ended with the evacuation of Dunkirk. If the reader finds the article lacking in specific detail he is asked to remember that all the writer's records, together with the rest of his personal belongings, were lost at Dunkirk, and that the paper is not meant to be an exhaustive survey from which conclusions may be drawn, but rather one surgeon's experience in a limited number of cases.

The method used in this treatment of open wounds was to pack them with powdered sulphanilamide. Sulphapyridine (M & B 693) was never used. At no time during the treatment was sulphanilamide given by mouth, nor was it given to controls treated with a flavine pack. Any effect was exerted by the presence of sulphanilamide locally in the wounds. The anaesthetic employed was sodium pentothal, combined with gas-and-oxygen.

Technique

Pre-operative treatment was as in ordinary surgical procedure. The skin edges of the wound were then excised and the depths of the wound examined. After the extent of the wound had been ascertained the skin opening was enlarged and the whole area laid open to allow for drainage. As a general rule the area of damaged muscle was very much greater than the aperture which led to it through the skin. This was particularly the case in wounds from trench-mortar fragments.

All muscle fragments, all discoloured muscle, and all muscle which although apparently healthy in colour did not respond to stimulation by contraction or twitching were removed. Whenever doubt existed as to the viability of the muscle it was left and no extensive excision was undertaken. The wound was made shelving so far as possible during this excision of muscle. Absolute haemostasis was then secured, all bleeding points being ligatured and all the oozing checked by the introduction of hydrogen peroxide into the wound. Powdered sulphanilamide was then placed in the cavity. It is of the greatest importance to introduce it into every corner, pocket, etc., of the wound. Failure to observe this precaution is, in my opinion, responsible for partial failures and doubtful results. When treating the first few cases sulphanilamide was poured into the wounds. This was found to be unsatisfactory, as some corners were left untouched. A large Volkmann spoon was then used to introduce the powder. This was also found to be unsatisfactory, although better than merely pouring it in. When in contact with the serous exudate on the surface of cut muscles the powder becomes a paste and adheres to the muscle, so that most of it is lost from the spoon by the time the deeper recesses are reached. Moreover, the remainder tends to adhere to the spoon, will not pour, and is difficult to get into the deeper recesses. Finally, half a tablet of sulphanilamide was held in the jaws of a pair of Spencer Wells forceps, and introduced into the depths of the wound at the required site. The half-tablet was then crushed by the forceps, the forceps withdrawn, and the crushed half-tablet left in the required position. This procedure was repeated in any part of the wound that seemed unlikely to be reached by the mere pouring in of powder. After all recesses had been filled in, the main cavity was packed with powdered sulphanilamide, 20 grammes being introduced. Insufflation might be still more simple than the above method. I have not tried it, as the necessary equipment was not available.

After the wound had been filled in with sulphanilamide it was left open, no attempt at suture being made. The open wound was covered with gauze smeared with sterile vaseline, and over this was placed elastoplast or zinc oxide strapping, with the intention of closing the wound and of drawing the skin edges together so far as was possible. Wool was superimposed and the whole bandaged. If the wound involved a compound fracture the appropriate extension was applied.

During the ensuing twenty-four hours there was always some blood-stained serous ooze which soaked through the wool and bandage. This did not necessitate removing the bandage, but a fresh layer of wool was applied, this being covered with a fresh bandage. This procedure was repeated if necessary. The wound was not interfered with. No further treatment was undertaken until the fifth day after operation, when the wound was dressed and delayed primary suture was undertaken. By this time all the sulphanilamide had dissolved, and the wound was clean, had begun to granulate, and was suitable for suture.

The total number of cases treated by this method amounted to between 40 and 50. They fell into two groups—those treated previous to May 10, 1940, and those treated between May 10 and May 29. The former group comprises cases arising when an army is in the field and not in action with the enemy, and consists of compound fractures and penetrating wounds arising from road accidents, football accidents, etc.—exactly similar to cases met with in ordinary civil practice. The second group comprises cases resulting from enemy action —gunshot wounds, wounds from bomb splinters, trench-mortar splinters, etc.—cases similar to those met with in this country after enemy air raids. All the cases treated were wounds of limbs: no attempt was made to treat by this method abdominal, chest, or head wounds.

Group I: Cases Treated Before May 10, 1940

Cases treated in this group show a further difference from the cases treated subsequently. A culture was taken from the depths of the wound before any treatment was instituted, and a further culture was taken five days later when the wound was first dressed. Working in a C.C.S. I did not see the results of my treatment, since the cases had been evacuated to the base by the fifth day; but by courtesy of Colonel Leonard Colebrook, R.A.M.C., I was supplied with details of the progress of my cases, and could thus form an estimate of the value of this method of treatment.

After May 10 there was neither time nor opportunity for the procedure carried out previously. Cases were treated with the sulphanilamide pack, and owing to the delay in evacuation it was often possible to observe them for five days after treatment. A further difference between the two groups must be emphasized. Before May 10 cases were admitted and treated shortly after their injury, the usual interval being six hours or less, except in those with severe shock, which it was necessary to treat before attempting anything else. After May 10 cases were admitted to the C.C.S. days, not hours, after being wounded. Forty-eight hours' interval was normal; seventy-two hours' interval was frequent. Consequently infection was established before treatment was instituted; so that while it may be said that this treatment before May 10 was prophylactic, after May 10 it was definitely curative in action.

Group I cases comprised compound fractures of the long bones, penetrating wounds of joints, deep lacerations of the limbs, and two cases of stab wounds. Their total number was 15. They were all treated in the manner described under the heading "Technique," except that in the early cases not enough care was taken to ensure that the powder reached every recess in the wound. Certain of these cases have remained in the memory. They are given here, not necessarily in chronological order.

Case 1. A Motor-cycle Accident.—The left foot had been nearly avulsed. The patient was suffering from a compound comminuted fracture of the lower end of the left tibia, the capsular ligament of the left ankle-joint had been ruptured, and the cavity of the joint was exposed. The patient was admitted about six hours after the injury had been inflicted. The wound was excised and sulphanilamide introduced. A culture was obtained before treatment. This failed to grow organisms. The joint was fixed in the best position for ankylosis, on a back splint, and forty-eight hours later the patient was transferred to the base. After five days the wound was dressed and found to be completely sterile. It was sutured, and so far as my information extends the patient made an uninterrupted recovery.

Case 2. A Motor-cycle Accident.—There was a penetrating wound on the inner side of the right knee-joint. The joint surfaces were exposed, and much debris was present in the wound. The synovia was sutured with interrupted suture. The remainder of the wound was excised and packed with sulphanilamide. A culture was negative. The joint was fixed in the best position for ankylosis. After five days the wound was sterile. Delayed primary suture was performed, and the patient made an uninterrupted recovery.

Case 3. Deep Laceration of Anterior Aspect of Thigh.—Preliminary culture was sterile. Sulphanilamide was poured into the wound. This was an early case. The report from the base was to the effect that on dressing the wound five days later most of it appeared to be healthy. However, a bead of pus was noticed in one corner of the wound. Cultures of this bead revealed the presence of *Streptococcus haemolyticus.*

Cultures from the remainder of the wound were sterile. The patient suffered from no general disturbance, and his temperature and pulse were normal.

In no case was there any rise in the temperature or the pulse rate during the first forty-eight hours after treatment in patients treated by this method. They, without exception, described themselves as feeling very well. They slept well and morphine was not required. There was no cyanosis, and no signs were observed of overdosing with the sulphanilamide. Sulphanilamide is not a very soluble substance, and the powder is dissolved gradually and gives a steady supply of the drug. Other information about these cases is not available. Two cases revealed the presence of *Streptococcus faecalis* after five days, and in these I am doubtful of the efficacy of my technique.

Group II: Cases Treated After May 10, 1940

These comprise cases which were for the most part heavily infected before treatment was started. These patients had been wounded days before they arrived for treatment. No cultures were taken, and no attempt was made to diagnose the individual infection, but a rough classification was made into wounds infected by gas-producing organisms and wounds not so infected. The latter included both staphylococcal and streptococcal infections. The former included presumably infections by all forms of gas-producing organisms. These were diagnosed by the smell issuing from the wounds, the crepitus in the surrounding tissues, the presence of frothy discharge in the wound, the presence of blackened muscle bellies adjacent to apparently normal muscle, and the general condition of the patient: running pulse, brown furred tongue, intense toxaemia, and sometimes delirium. As the arrangements for evacuation were not working smoothly we were compelled to keep our wounded for some time until new arrangements could be improvised. This enabled us to watch the progress of each case for a period longer than was possible during the time that routine evacuation was taking place.

In this period, also, circumstances compelled us to treat many wounds with a flavine pack, since our supplies of sulphanilamide were limited. Thus an involuntary system of controls was instituted, and we were able to watch the progress of a series of wounds treated with sulphanilamide and to compare them with a series treated with flavine. As a general rule we reserved our sulphanilamide for the more serious, the more heavily infected, and the more extensively lacerated wounds. Flavine was used for gunshot wounds, for wounds that did not seem seriously infected, and for cases in which, whatever—within limits—the condition of the wound, the patient's general condition, the absence of toxaemia, etc., showed that he was resisting well without outside aid. All wounds in which crepitus extended from the wound and in which frothy discharge showed infection with gas-forming organisms were treated with sulphanilamide so far as our means allowed.

The following two cases seem worthy of mention:

Case 4.—Described to me by the surgical specialist of another C.C.S. Case admitted three days after wounds from bomb splinters. Wound of lower portion of left thigh involving compound fracture of left femur, and a further wound of the upper portion of the left leg involving the antero-external muscular part of the leg. There was also a compound fracture of the left tibia in its upper end and gas gangrene in both wounds. Wounds excised: gangrenous muscular bellies removed. Twenty grammes of sulphanilamide packed into each wound. Within twenty-four hours patient's general condition greatly improved. Pulse below 100; temperature, which had been subnormal, normal. This improvement was maintained. Two and a half days after the pack was introduced the patient complained of pain in the lower wound. The dressings were removed: no sulphanilamide powder remained; all had been dissolved. The wound appeared clean. A gauze pack was inserted. Subsequently the patient was encountered in England with his left leg amputated. He said that the lower wound had bled several times and was discharging pus. His left popliteal artery had been ligatured through the upper wound. This intervention had lighted up the gangrene infection and had necessitated amputation of the leg.

Case 5.—Wound of upper part of right thigh. Gas-gangrene crepitus extending over the anterior abdominal wall as far as the umbilicus. Excision and sulphanilamide pack. Complete recovery.

In most cases the early results were notable: within twenty-four hours after the treatment the general condition of the patient was much improved; toxaemia was greatly if not completely reduced, the pulse rate was down to normal, and the patient suffered from no pains and was alert, taking an interest in what was going on around. This improvement lasted for the whole time these patients were under our care. No patient who had received this treatment died while he was in the C.C.S.: this in spite of the fact that the wounds were heavily infected before admission. The same cannot be said for the cases treated with a flavine pack. In these cases toxaemia, a rapid pulse, and general asthenia persisted as a marked feature, and several patients who received no more than a flavine pack died whilst under our care. I am ignorant of the later results of this treatment, and indeed it is possible that these will not be as good as the early indications promised. Nevertheless, for the surgical specialist in a C.C.S. here is a treatment which appears to control infection in wounds at least long enough to get the patients back to a base hospital under normal conditions of evacuation, and this in itself is a great advance. It is possible that the work of the surgical specialist to a C.C.S. will in future resolve itself into securing haemostasis and packing with sulphanilamide in wounds of the limbs, if not of the abdomen, chest, and head.

Mode of Action

The mode of action would appear to be both general and local. Sulphanilamide has a general effect when injected subcutaneously, since cases of cerebrospinal meningitis in which persistent vomiting has prevented the oral administration of sulphanilamide have responded to the drug when injected subcutaneously; on the other hand, the necessity of applying the powder to every part of the wound points to some local action over and above the general action already noted. It may be that the gradual dissolving of the powder produces a local concentration which has a more powerful effect. The fact that large quantities of the drug have been used in the pack without signs of overdosing would seem to show that some local action takes place and that all the powder introduced does not get into the general circulation. These considerations raise the point as to whether it is necessary, in cases of multiple wounds, to pack each wound with sulphanilamide. If the action is solely a general one it should suffice to pack one wound only, or to insert the powder at a convenient site away from any wound. If there is a local effect superimposed on the general effect it will be necessary to pack each wound separately.

Summary

A number of wounded patients have been treated by packing the wounds with sulphanilamide powder. The technique of this method is described.

A number of cases are recorded, with the early results of the treatment, and the mode of action is discussed.

It is claimed that this treatment will at least save labour and time in casualty clearing stations by controlling infection until the patient arrives at a base hospital.

PARESIS FOLLOWING HERPES ZOSTER

A REPORT OF TWO CASES

BY

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Herpes zoster is usually a benign type of infection mainly affecting the sensory part of the nervous system. Motor symptoms occur infrequently, although both upper and lower motor neurone palsies following typical zoster have been recorded. Upper motor neurone lesions were described by Besta and Vercelli (quoted by Rocchi, 1938), Bruce (1907), and Worster-Drought and McMenemey (1933). In each of these cases there seemed no other explanation for the pyramidal lesions, although Alajouanine and Griffith (1931) recorded an enlightening case in which herpes zoster followed by upper motor neurone paresis of the right leg occurred in a girl aged 17 who six years later developed typical disseminated sclerosis. Among the lower motor neurone palsies the one most often encountered is facial paralysis and occasional deafness complicating geniculate zoster. Examples of this syndrome were described by Ramsay Hunt (1907), and it is now known by his name. The next most frequently reported palsy appears to be oculomotor paresis complicating trigeminal zoster. Cases of this type have been described by Essen-Möller (1936), Federici (1937), Carmody (1937), and others.

Brachial and abdominal palsies are more uncommon: Kinnier Wilson (1940) describes a zoster of C4 segment with weakness of the deltoid and biceps (C5). He also mentioned that in any given segment concerned "either all or a few or only one muscle may be affected." Taylor (1895) recorded a case of right abdominal zoster with paralysis of the recti and obliques, and Rocchi (1938) a case of zoster affecting segments D12 and L1 on the left side with weakness of the corresponding obliques, which showed a partial reaction of degeneration. Similar cases have been described by Bloedorn and Roberts, Worster-Drought, Taylor and Chairon (quoted by Kinnier Wilson, 1940).

Lower motor neurone paralysis complicating lumbar or sacral zoster seems a rare condition. Hardy (1876) and Cornil (1930) each described one case—the former zoster of the sciatic nerve with paresis of the calf muscles, the latter zoster of the thigh with atrophy of the quadriceps and loss of the knee-jerk. Davidsohn and Oppenheim (quoted by Rocchi, 1938) observed in a sacral zoster transitory motor disturbances of the bladder and rectum.

Two personal cases of lumbar zoster, very similar in distribution and course, are described here, both complicated by lower motor neurone paresis involving the affected segments.

Case I

A widow aged 73 was admitted to the Central Middlesex Hospital on January 15, 1940. For several years she had had epigastric pain of a typical peptic ulcer pattern. Apart from this she had been well until an attack of shingles in the right leg two months previously. Since then she had been shaky, and complained of neuralgia in and weakness of this leg, which tended to give way on walking.

On examination the patient was found to be, for her age, a very well preserved woman with a slight tremor of the lips, tongue, and arms. The scars of a recent herpes zoster were present on the inner side of the right thigh and on the front of the leg in the distribution of the third and fourth lumbar roots. Cutaneous sensation to pin-prick and cotton-wool was slightly diminished over this area; elsewhere it was normal. The right quadriceps was slightly wasted and its power and that of the abductors of the thigh diminished. All the tendon reflexes were brisk, with the exception of the right knee-jerk, which was absent. The plantar reflexes were flexor and the abdominals were absent. The arms, the cranial nerves, and the fundi oculi were normal. The peripheral arteries were hardened, but the heart and lungs were normal; blood pressure was 150/90, and the urine was normal. The occult blood reactions in the faeces were positive on two out of three examinations, and a barium meal showed evidence of a simple pyloric ulcer. A fractional test meal gave a normal result.

The cerebrospinal fluid on January 20 was under normal pressure and was clear and colourless. There were 21 cells per c.mm. present—1 polymorphonuclear leucocyte and 20 lymphocytes. The total protein was 0.035% and the Lange curve 0001221000. The Wassermann reaction was negative. On February 1 the fluid contained only 14 cells per c.mm.—1 polymorph and 13 lymphocytes. A radiograph of the spine showed osteo-arthritis and some osteoporosis of the thoracic and lumbar vertebrae.

The patient was given a course of faradism and exercises to the affected muscles. A gradual improvement in power took place, and before her discharge on February 21 the right knee-jerk was noted as just present; the neuralgia was less severe than on admission. In addition she had been put on to a peptic ulcer regime with marked benefit.

She has been seen at monthly intervals since, and the cerebrospinal fluid was re-examined on April 22 and was found to contain only 1 lymphocyte per c.mm. The protein was 0.035%, and the Lange curve negative. The slow improvement in power continued, and the knee-jerk was gradually increasing in briskness. When last seen on July 20, nine months after the onset of the eruption, she was looking extremely well. She had lost her dyspeptic symptoms and had gained 10 lb. The neuralgia was occurring occasionally at night only and had diminished in intensity. The right leg now appeared to her to be as strong as the left, but on examination slight weakness of the quadriceps remained and the right knee-jerk was not quite as brisk as the left.

Case II

A married woman aged 53 was admitted to Shenley Hospital on April 3, 1938, with a severe depressive reaction state and suicidal tendencies. She slowly improved mentally and was occupying herself fairly well when on September 17 she complained of severe stabbing pain in the front of the right thigh. Next day she had a temperature of 99.8° and developed a typical herpetic eruption on the front of the thigh, which spread to the inner side of the right leg the following day. The lesions approximated to the distribution of L3 and L4 spinal segments. On this day—September 19—lumbar puncture was performed, and clear fluid under normal pressure was obtained. This contained 38 lymphocytes per c.mm. and 0.05% of protein. Four days later her temperature had settled, and she complained that she could not lift her right leg from the bed. The herpetic eruption had begun to heal, although pain was persistent: some analgesia was found between the drying vesicles. Wasting of the quadriceps was observed (half an inch), with almost complete loss of power: the adductors were normal; no fibrillation was present. Tendon reflexes were normal except that the right knee-jerk could not be obtained. On September 26, eight days after the eruption, the cerebrospinal fluid showed 28 lymphocytes per c.mm., with 0.045% protein. There was slight weakness of the adductors and complete flaccid paralysis of the quadriceps; the knee-jerk was still absent, and wasting had increased to 1 inch in circumference of the thigh. There was no improvement in the paralysis until October 1, when she could just extend the knee and flex the thigh, and the cerebrospinal fluid now showed 16 lymphocytes per c.mm., with 0.03% protein. The vesicles had disappeared, but nocturnal neuralgia still troubled her, although it was controlled by analgesics. Movement gradually improved with massage and exercise, and she had regained about half her power by October 14, although the knee-jerk was still absent.

On October 20, nearly five weeks after the beginning of the illness, the cerebrospinal fluid contained 11 lymphocytes, with 0.03% protein. Gradual improvement followed, and on November 17 it was noted that the right knee-jerk was just present. On December 19 the last lumbar puncture was done and 8 lymphocytes with 0.032% protein were found. Wasting was persistent and she still complained of occasional twinges of pain in the thigh and leg. The knee-jerk had returned almost fully five months after the onset, and power was fair, although she still used a stick.

When last seen about a year after her illness she was symptomless, except that the right leg tired easily. Examination revealed half an inch of wasting in the right quadriceps, persistent scars of the eruption, and great improvement in her mental condition. The right knee-jerk seemed as brisk as the left.

Commentary

These two cases demonstrate an unusual complication of herpes zoster. Although no complement-fixation test was done there was no reason to doubt the diagnosis, as the clinical features and the course were typical. It was considered important to exclude any underlying condition which might have been responsible for the paralysis, since it is well recognized that zoster may occur in other diseases of the spinal cord, particularly in disseminated sclerosis, tabes dorsalis, and cases of cord compression. There were no clinical signs to suggest the presence of any such lesion in our cases, although in Case I the history of dyspepsia and a positive occult blood reaction in the faeces led us to exclude by radiograph spinal metastases from possible carcinoma of the stomach.

The pathology of herpes zoster is still somewhat obscure, as so few cases come to necropsy. Head and Campbell in 1900 in an exhaustive paper mentioned that Bärensprung in 1861 first showed that zoster was a disease of the nervous system associated with changes in the posterior root ganglia. They described their post-mortem findings in 21 cases in which death occurred at all stages of the disease from three days to over two years after the outbreak of the eruption, and concluded that the primary lesion was an acute round-cell infiltration with areas of haemorrhage in the affected posterior root ganglia, and that changes found in the posterior nerve roots and spinal cord were secondary degenerative processes. The fact that Price (1937) gives a similar account of the pathology of zoster without mentioning the existence of any spinal cord lesions suggests that Head and Campbell's ideas are still in the main accepted in this country.

This view has been challenged by the French school, notably by Jean Lhermitte and his collaborators, who in three communications reported acute inflammatory changes not only in the ganglia but also in the posterior roots, the meninges, and the cord itself. In the first of these papers Lhermitte and Nicolas (1924) described the post-mortem appearances of a patient dying of bronchopneumonia seven weeks after the onset of the herpetic eruption. They found perivascular infiltration of leucocytes and mononuclear cells with vascular dilatation and demyelination in the posterior horns of the affected segments. The anterior horns showed atrophic changes in the cells with demyelination of the nerve roots and some lymphocytic infiltration: in spite of this no paralysis was observed clinically. There were no changes in the white matter except for one area in the pyramidal tract in which perivascular "cuffing" was observed. It is of interest to note that the cerebrospinal fluid of this case showed a pleocytosis of 88 lymphocytes per c.mm. on the second day of the eruption. Similar observations were recorded in two subsequent papers (Faure-Beaulieu and Lhermitte, 1929; Lhermitte and Vermès, 1930). In the former, lesions spreading to neighbouring segments were found in the posterior horns. Kinnier Wilson (1940) records similar findings by Nicolesco, Thomas and Laminière, and Schlesinger.

The view that the infection involves the meninges and the cord as well as the posterior root and its ganglion is supported by the frequent occurrence, according to Kinnier Wilson, of a pleocytosis in the cerebrospinal fluid. Both our cases were typical in this respect.

It would appear probable, therefore, that zoster is essentially an acute posterior poliomyelitis involving the whole of what we suggest may be called the "segmental sensory neurone." Although anatomically the root ganglia are placed outside the spinal cord, they consist of cells which have migrated out from the posterior horn, and thus their constant involvement is understandable. The finding of inflammatory changes in the anterior horn by Lhermitte and others is presumably due to the spread of the virus from the posterior horn, and would explain the occasional occurrence of motor lesions in a disease which primarily involves the sensory system.

Since so few cases have been described it is impossible to determine accurately the course and prognosis of paralysis complicating zoster. Our cases, in which identical segments were attacked, ran similar courses. The pleocytosis took many weeks to subside: Case I showed 14 lymphocytes three months after the onset, and Case II 8 cells nine weeks afterwards. When last seen, nine and twelve months respectively after the eruption, neither of these patients had fully returned to normal: Case I was complaining of nocturnal neuralgia in the leg and had a slightly diminished knee-jerk, and Case II showed slight wasting of the affected muscles. The crural paralyses in both Hardy's and Cornil's cases appear to have gradually improved, and in Rocchi's case the paralysis of the obliques had almost disappeared within a year. These cases show that though recovery is slow, satisfactory function can return within a year. The observation of further cases for longer periods would be necessary to determine whether this is the rule and whether complete recovery may not be possible.

Summary

Two cases of lower motor neurone paralysis complicating herpes zoster are described, and the pathology is discussed.

We desire to thank Dr. H. Joules for permission to publish Case I, which was under his care, and Dr. V. C. Robinson for his help in translating the literature.

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A. Christie (*J. Pediat.*, 1940, **17**, 502) reports that a follow-up study of children to test the duration of Schick immunity was made with various antigenic materials with the following results. According to the type of material, doses given, and the period between injections and the Schick test, 77 to 95% of the group showed negative Schick reactions in four to twelve weeks. After a four to nine year follow-up period 46 to 88% of the known Schick-negative reactions were found to be still negative and 12 to 54% had become positive. Christie concludes that all children immunized in the first year of life should be Schick-tested again on admission to school, when those who are positive should be given a stimulating dose of toxoid.

BELL'S PALSY AND HERPES ZOSTER

BY

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Major, R.A.M.C.

Clinical evidence has long led to the belief that the commonest aetiological agent in Bell's palsy is exposure to a cold draught. But its mode of action is obscure, and whether cold alone is adequate or whether it exerts its effect upon an already susceptible nerve has been the subject of much debate. Were cold *per se* the deciding factor one would expect a greater incidence, both total and seasonal. Seasonal figures, however, show no great variation, although it is a fact that one new case is commonly followed by several others at certain seasons of the year (Walshe, 1940). Instances of bilateral, recurrent, hereditary, or even familial peripheral facial paralysis seem to support the idea of a predisposing factor (anatomical or otherwise). On the other hand, the facial nerve seems to be just as susceptible to toxic and infective conditions as to the common draught. Such conditions may be general—for example, polyneuritis—or local, such as tetanus.

When Ramsay Hunt (1907) described herpetic involvement of the geniculate ganglion of the facial nerve he focused attention on the virus of herpes zoster as a possible cause of Bell's palsy. In the syndrome which now bears his name we find the combination of peripheral facial paralysis and a herpetic eruption in and around the external auditory meatus of the same side. Vesicles may also be present on the pillars of the fauces and the anterior two-thirds of the tongue on that side. The subject usually complains of pain in the ear, herpetic vesicles make their appearance, and facial paralysis follows in a few days. This sequence is not constant, and the condition may be ushered in with a painless facial paralysis. The small size and the transient nature of many vesicles, and their frequently hidden position in the meatus, make geniculate zoster a condition easily missed. The eruption may precede the paralysis by a week or more, and many cases must then be labelled Bell's palsy. The obvious question that arises is whether Bell's palsy is ever due to invasion of the geniculate ganglion by the zoster virus. It is not difficult to imagine geniculate zoster without the cutaneous eruption. Aitken and Brain (1933) were able to demonstrate by complement-fixation tests that in the blood serum of patients with geniculate zoster there were antibodies to the zoster virus. The sera of twenty-two cases of Bell's palsy were found to contain zoster antibodies in only four instances. Serological evidence therefore points to zoster infection as a probable though uncommon cause of Bell's palsy. It is thus of interest to record a recent clinical experience which supports this view.

In March, 1940, a number of cases of herpes zoster were encountered. They occurred in crops of two, three, or four at a time, presented no unusual features (with one exception), and ceased to appear at the end of the month. In all there were perhaps twenty cases; probably others occurred but were not seen. That these cases represented a small epidemic is supported by their rarity during other months of that year. Many men were but mildly affected and did not take to bed. A few, however, showed general disturbance, with a profuse painful eruption, and were admitted to hospital. In one ward, at one time, there were five such cases.

Case Reports

Case 1. Herpes Zoster involving Th. 9 Segment on Left Side.—The illness was ushered in with headache, malaise, and a bout of sickness four days before admission. Burning pricking pain in the skin of the affected segment followed, and a typical herpetiform rash subsequently developed. During the acute stage there was pyrexia of 101°, but this subsided to normal in three days. There was no glandular enlargement; a white cell count was normal (8,700 cells per c.mm.), but there was a slight lymphocytic reaction in the cerebrospinal fluid (15 lymphocytes per c.mm.); the protein content was normal (25 mg. per 100 c.cm.). Pituitrin injections were ineffective. Recovery was uneventful.

Case 2. Herpes Zoster affecting Th. 7 and 8 Segments on Left Side.—Anorexia, lassitude, and pyrexia (100°) preceded the onset of neuralgia and the appearance of the rash by three or four days. The latter was profuse, and much pain was experienced for a time. Lumbar puncture was not done. There were no enlarged glands. Pituitrin was without effect.

Case 3. Herpes Zoster involving L. 1 and 2 Segments on Right Side.—In this case the rash was rather late in appearing. The patient experienced severe pains and dysaesthesiae for a week before its arrival. A diagnosis was made of meralgia paraesthetica before the vesicles were detected. There was a curious frequency of micturition, with pyrexia (99°), shivering attacks, and discomfort over the bladder. The urine was normal on several examinations, however, and cultures were negative. The remote possibility of vesical herpes zoster was considered. At first the rash was practically confined to the first lumbar segment, but later it spread to involve the adjacent area below. A normal cerebrospinal fluid was found and there were a few painless glands in the inguinal regions. Pituitrin was not beneficial.

Case 4. Herpes Zoster involving Th. 6 Segment on Left Side.—This patient, who came from the same unit as Case 5, developed pain, pyrexia (99°), and a rash one day before admission. The vesicles were sparse, but there was much neuralgia and cutaneous hyperaesthesia. Three days after the rash had appeared it would have been impossible to recognize the true nature of the eruption, which could well have been missed and the condition labelled "intercostal neuralgia." Lumbar puncture revealed a normal fluid. Pituitrin apparently reduced the pain and discomfort.

Case 5. Herpes Zoster of the Trigeminal Nerve with Ipsilateral Facial Paralysis.—This patient, aged 24, was admitted to hospital with a history of severe pain in the left side of the face for three or four days. A profuse herpetiform rash developed during the night before admission. Within twenty-four hours numerous large coalescing blisters were clustered over the lower half of the left side of the face. There was much redness, swelling, and oedema of the tissues, with a brisk general reaction. The temperature remained at 100° for forty-eight hours and malaise and anorexia were marked. The vesicles were distributed over the areas supplied by the maxillary and mandibular divisions of the trigeminal nerve; a few were clustered together on the lower eyelid, and others on the chin just crossed the midline. There were no vesicles or other form of eruption in the auricular zone. The tympanic membrane, external auditory canal and meatus, concha, tragus, antitragus, helix and fossa, and posterior surface of the lobe of the ear were entirely normal. There was no earache throughout the course of the illness. In the area of the ophthalmic division no eruption appeared, but tactile and painful sensations were diminished. This was especially marked in the supra-orbital and nasociliary areas. Owing to the profuse rash it was impossible to be certain whether there was any sensory change over the areas subserved by the second and third divisions of the fifth nerve. Later in the illness tactile and painful sensations were diminished. The corneal reflex was almost absent, but a feeble conjunctival response persisted. The mucous membranes of the cheek, lips, gums, tongue, and fauces were normal. The sensation of taste was normal and there was no weakness of masseter or temporal muscles.

On the morning of the fifth day in hospital, when pain had subsided and the rash was drying up, the patient awoke with a complete peripheral facial paralysis on the left side. There had been no earache and the ear was normal. The mucous membranes of the mouth were still healthy. The sense of taste, however, was almost completely absent over the anterior half of the tongue on the left side. The patient was unaware

of this hemiageusia. Blunting of sensation over the left side of the forehead and cheek was still present. He remained in hospital for several weeks and made a complete recovery. The sensory changes persisted for a few more days: the hemiageusia disappeared between the nineteenth and twenty-third days of the illness, while the facial paralysis had practically gone three weeks after its appearance.

Case 6.—While the above five cases of herpes zoster were in hospital I saw a case of Bell's palsy in the out-patient department. It was a typical peripheral facial paralysis in all respects and there had been no pain or rash or general reaction. The man made a good recovery within a month. He was employed in the same unit as the first patient (Case 1), and I learned that there had been two or three other instances of herpetic eruption there. Cases 2, 3, and 4 came from separate units, but their quarters were adjacent. I saw several other cases of herpes zoster from the same unit as Case 5. The observation of Case 6 during the height of the epidemic becomes significant when it is stated that only two instances of Bell's palsy have been seen at this hospital during the past twelve months. The second occurred in September, 1940.

Commentary

The first interesting feature of these cases was the development in one of them, on the eighth day, of an ipsilateral facial paralysis. The herpetic eruption was confined to the second and third divisions of the trigeminal nerve, but there was diminished sensation to touch and pain over the first division. *No auricular zoster developed.* Undoubtedly, then, the herpes virus had invaded both the Gasserian and geniculate ganglia. The former resulted in the facial eruption and the latter in the facial paralysis. Whether these manifestations appeared in order of the involvement of these structures can only be surmised. We do not know what interval elapses between the time of infection of the ganglion cells and the appearance of the rash, but it is quite possible the virus attacked the geniculate from the Gasserian ganglion by way of the superior superficial petrosal nerve. It was not until the infection reached the cell stations in the geniculate ganglion of the fibres of the chorda tympani nerve that taste was affected.

The absence of auricular herpes is especially interesting. It indicates that herpetic invasion of the geniculate ganglion can take place without any cutaneous manifestation in the distribution of its sensory fibres. Facial palsy may be the only sign. Hemiageusia would probably be a more frequent sign in facial paralysis due to geniculate ganglionitis than in that due to a lesion arising at the stylomastoid foramen.

Another interesting feature was the isolated occurrence in the same unit as one of the herpes zoster patients of a typical Bell's palsy; this suggests a common aetiological agent. The possibility of coincidence cannot, of course, be denied, but it remains that this case of Bell's palsy was the only one observed at the hospital for a period of nine months. When considered in the light of Case 5—in which zoster and facial paralysis were present simultaneously—the suggestion of a virus origin of Bell's palsy becomes highly probable.

Such findings suggest the possibility of analogous lesions in other sensory nerves. The abortive nature of the rash in Case 4 brought to mind the condition of intercostal neuralgia, and the lumbar neuritis in Case 3 suggested a diagnosis of meralgia paraesthetica during the week preceding the rash. Some cases of facial neuralgia may be due to herpetic Gasserian ganglionitis.

Summary

In a small outbreak of herpes zoster one case of combined trigeminal and geniculate zoster was encountered. It was characterized by facial herpes and an ipsilateral facial palsy. The former preceded the latter by five days. No auricular or faucial herpes developed. Facial paralysis and hemiageusia were the only signs of geniculate involvement. During this zoster epidemic there occurred the only instance of Bell's palsy seen at the hospital for a period of nine months. The patient came from the same unit as one of the zoster cases.

This evidence supports the view that some cases of Bell's palsy are due to herpetic infection of the geniculate ganglion.

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AN OUTBREAK OF TRICHINIASIS IN WOLVERHAMPTON AND DISTRICT

A CLINICAL ACCOUNT OF SEVEN CASES

BY

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Acute trichiniasis is produced by the embryos of *Trichinella spiralis* during their migrations from the human intestine to the voluntary muscles, and, though extremely rare in Great Britain, the disease is not uncommon in America and Germany. The life history of the parasite is adequately described in the standard textbooks, and, as is well known to medical practitioners and students, infection in man is acquired by eating raw or undercooked pork. The clinical features of the cases described in this article were distinctly unusual and caused some difficulty in diagnosis. Nephritis, pneumonia, renal damage, influenza, pyrexia of unknown origin, suspected enteric fever, and pyelitis were the conclusions arrived at before admission of the patients to New Cross Hospital.

The predominating signs and symptoms consisted of oedema of the eyelids, headaches, conjunctival haemorrhage or injection, mental torpor with lethargy, drowsiness, confusion, and slowed cerebration, heaviness in the limbs, generalized aches and pains, muscular tenderness and stiffness, disturbances of reflex action, paresis, and severe constipation. Vomiting occurred at the outset in two cases and colic in one. My colleagues and I were aware that we were confronted with a distinct clinical entity which was hitherto unknown to us. Blood urea investigations were carried out in the early cases and yielded results which fell well within normal limits. Examination of the blood was next decided upon, and the presence of eosinophilia was discovered. The patients were then seen in consultation with Dr. J. H. Sheldon, consulting physician to New Cross Hospital, who put forward a tentative diagnosis of trichiniasis.* Clinically this disease is generally described in three stages in accordance with the life history of the parasite. Carmichael Low and Hamilton Fairley (1933) state that for the first week during the invasion period gastro-intestinal symptoms develop, with nausea, vomiting, colic, and diarrhoea with perhaps blood and mucus; then when migration of larvae begins myositis of the tongue, laryngeal, and intercostal muscles, and the diaphragm occurs, giving rise to difficulty of swallowing, speech, and respiration. The muscles of the jaws, arms, legs, and abdomen may also be involved, with stiffness and pain; the affected areas are extremely tender and hard to the touch. Oedema, especially of the face, urticaria, leucocytosis with high eosinophilia, prolonged remittent fever (102° to 104° F.), and sweating are said to be characteristic. Cachexia and subcutaneous oedema

* A preliminary account of the present epidemic is given by Dr. Sheldon in the current issue of the *Lancet* (February 15).

and finally, during the period of larval encystment, death may take place from toxaemia, with respiratory disturbance and coma. The fact that many of these symptoms were not shown by the patients under consideration threw doubt upon the diagnosis, and the high incidence of the disease in women also caused suspicions to be directed elsewhere for a time. However, on January 24 biopsy of the pectoral muscle was performed, and the diagnosis was established by the identification of the coiled-up embryos of *Trichinella spiralis* in the characteristic lemon-shaped areas. There was little or no capsule formation, and Dr. Paul B. Beeson of Harvard, who was shown the specimen and confirmed the diagnosis, was of the opinion that the parasite had only just reached the muscle. On January 27 further confirmation was obtained when another successful biopsy was performed.

Case I

A previously healthy 21-year-old married woman noticed puffiness of her eyelids on waking on the morning of December 22, 1940. On the same day she developed severe temporal headache and pain in the left loin. The temperature was normal; there was no cough and no diarrhoea. Vomiting occurred once daily from December 23 to 25 inclusive, and aching pains in the limbs supervened during the same period. Insomnia was present on December 25 and 26. The swelling of the eyelids and the aching pains in the limbs persisted, and she was admitted to hospital on December 28.

Examination showed marked puffiness and swelling of the eyelids and injection of the conjunctival vessels, and the facies was that of a woman twice her age. The only other abnormal physical signs present were a few crepitations in the left lung. There were no abnormal constituents in her urine; the blood pressure was 126/84, the temperature 99°, the pulse 104, and the respirations 24; the blood urea was 37 mg. per 100 c.cm. The mental attitude was distinctly unusual; she complained of feeling "all fuddled," took no interest in her surroundings, and felt very miserable. She showed signs of impairment of memory, and appeared to be dazed and somewhat confused.

Gradual improvement took place, and she was discharged from hospital on January 11, 1941, free from symptoms.

Case II

A housewife aged 36 years developed severe headache, backache, and pains in the left groin on the morning of December 19, 1940. During the afternoon of the same day she observed that her eyelids and the upper part of her face were becoming puffy and swollen. The swelling of the eyelids continued to increase slowly, and aching pains appeared in the limbs and neck on December 21, when the arms felt too heavy to lift, and all her muscles ached to a severe degree even when moving. In spite of her illness she left home to do some shopping, and on returning home in a low-spirited and depressed condition the severity of the headache and backache together with the tiredness of the limbs was such as to cause her to drop into a chair in a fainting condition. There was no history of diarrhoea.

On admission to hospital on December 22 the patient appeared to be in a state of abject misery, was obviously ill, and had extensive swelling and puffiness of the eyelids together with conjunctival haemorrhages. The oedema of the eyelids was sufficient to interfere with vision, and she was unable to see a coin placed in her hand; the temperature was 100°, the pulse rate 120, and the respirations 24. Areas of tenderness were present in both loins, in the back, and to a less extent in the abdomen. Stiffness of the neck, which was most noticeable when she sat up, occurred on December 22 and lasted for three days. Vomiting was present on the second and fourth days after admission; the urine was normal and the blood pressure was 160/110. The patient's mental attitude was abnormal; there were evidences of confusion and slowed cerebration, and when addressed she had to think for some time before she was able to understand what was required of her.

During the night of December 26 loss of power in the left leg supervened, and next morning this limb could not be moved, being described by the patient as heavy and numb. This paresis persisted for twenty-four hours, after which gradual improvement took place. The knee-jerks and ankle-jerks were present; the left plantar reflex was practically absent, and the right easily flexor.

Constipation was pronounced and insomnia troublesome during the first week in hospital. The blood urea was 33 mg. per 100 c.cm. and the urea-clearance factor 88% of normal. Discharge from hospital took place on January 11, 1941, when the patient was free from symptoms.

Case III

A married woman aged 29 years became ill on December 22, 1940, the initial symptoms being supra-orbital headache and swelling of the eyelids. She sought medical advice and was thought to have nephritis. On December 24 the swelling of the eyelids became much worse—the face and forehead were affected; the head felt much larger than normal, and headache assumed a violent character. Abdominal aches and pains next developed; there was no vomiting and no diarrhoea, and the urine was stated to be scanty and dark in colour.

On admission to hospital on December 25 pronounced oedema of the face, eyelids, and frontal area of the scalp, together with chemosis and conjunctival haemorrhages, was noted. The temperature was 102°, the pulse rate 120, and respirations 24; stiffness of the neck and some muscular tenderness were also present. The urine, which was normal on admission, contained a large amount of albumin on December 28 and 29, and albuminuria reappeared on January 1, persisting for six days.

Loss of power in the left arm and to a less extent in the right supervened on December 29, and this paresis, which was not a true paralysis, persisted for three days. During meal-times, while using a fork, evidence of true incoordination in the left arm was noted. Drowsiness and lethargy developed on December 31, cerebration became slow, the memory was impaired, and mental confusion existed; finding everything an effort, the patient felt miserable. This state of mental torpor continued for four days, during which time she did not recognize her husband and showed a complete lack of interest in her surroundings. Low pyrexia of an irregular type continued for eleven days, and severe constipation necessitated enemata and aperients. The urea-clearance test showed the blood urea to be 40 mg. per 100 c.cm., and the urea-clearance factor was 100% of normal.

Convalescence was gradual, and the patient was discharged on January 14, 1941, free from symptoms.

Case IV

A housewife aged 36 years had a cold in the head on December 16, 1940, and three days later sought medical advice on account of swelling of her face, eyes, and lips. Violent headache set in simultaneously, being accompanied by severe pains in the lower abdomen, most pronounced in the left iliac region. Retention of urine and complete constipation occurred on December 19 and 20. Weakness of the left hand appeared on the third day of her illness; there was no history of diarrhoea.

On admission the clinical picture was that of uraemia: drowsiness and lethargy were extremely well marked; inability to sit up in bed existed for two days after admission; slight oedema of the upper part of the face and eyelids was still visible; and retention of urine, lasting for four days, was present, catheterization being necessary. The urine contained a trace of albumin, which disappeared in the course of a few days; the blood pressure was 104/90, and severe constipation called for treatment.

There was paresis of the left hand; the grip was weak, incoordination was detected by the finger–nose test, and with the exception of the biceps-jerk all the left arm reflexes were absent. The right arm reflexes were sluggish, both knee-jerks were practically absent, and the plantar reflexes were flexor. No muscle tenderness was elicited, and there was no disturbance of joint sense. The blood urea was 46 mg. per 100 c.cm., and the urea-clearance factor 160% of normal.

Convalescence was uninterrupted, and the patient returned home on January 15, 1941.

Case V

A housewife aged 37 years complained of severe headache, giddiness, and swelling of the eyelids on December 14, 1940. Heaviness of the legs developed at the outset of the illness; they seemed to droop when attempts were made to raise them, and felt as if they were made of lead. To a minor extent similar sensations were experienced in both arms. Oedema of the eyelids persisted for some time, and on December 18 was remarked upon by a relative. Vomiting started on December 20 and ceased on December 24; pyrexia, sweats, and loss of memory were present, but no abdominal pains and no diarrhoea.

On admission to hospital on December 28 the clinical picture was that of tuberculous meningitis; some degree of coma, with signs of meningeal irritation, cervical rigidity, and slight head retractions, was noted. At intervals the patient gave vent to a peculiar high-pitched piercing "meningeal" cry, of which she was conscious. Kernig's sign was positive on both sides; the right plantar reflex gave an extensor response, whereas the left was flexor; the abdominal and ankle reflexes were absent, the knee-jerks practically so, and examination of the optic disks revealed slight papilloedema. The skin was moist, the face puffy, and incontinence was present.

Lumbar puncture revealed clear colourless fluid, very scanty lymphocytes only in films—1 cell per c.mm.—chlorides 710 mg. and protein 10 mg. per 100 c.cm., and globulin within normal limits. The temperature was 101°, the pulse rate 120, respirations 26, the blood pressure 100/80, and the blood urea 35 mg. per 100 c.cm.; the urine contained no abnormal constituents. The hands and legs became oedematous on December 29, and three days later considerable muscle tenderness was present, pinching of the calves causing the patient to flinch even though she was incapable of answering questions. Both plantar reflexes were now extensor; the legs were drawn up, and she appeared to be gravely ill. This stage of meningeal irritation passed off gradually; control of the sphincters was regained on January 4, 1941, but drowsiness and lethargy remained for a time.

Examination on January 9 revealed no nystagmus; the disks were normal, and the pupils equal and reacting; the arm muscles were feeble and all reflexes absent, and there was a gross incoordination of the arms with severe dysdiadokokinesia, suggesting a cerebellar lesion. Joint sense was normal in the arms but absent in the legs; the knee-jerks were sluggish and the ankle-jerks were absent; the left plantar reflex was flexor and the right plantar reflex doubtful. The heel–shin test was badly executed and the abdominal reflexes were absent. Constipation was extremely troublesome in spite of aperients and enemata.

By January 16 the patient was greatly improved and her mentality was normal; muscle power in the arms was normal, but there was still incoordination in the right arm; oedema of the left foot and leg was present, the knee-jerks were sluggish, and the plantar reflexes were flexor. A week later constipation still persisted and some degree of faecal impaction occurred; there was considerable loss of postural tone on holding the arms outstretched, and gross incoordination of the right arm with some degree of dysdiadokokinesia; the arm reflexes were slightly increased, and all others were normal. On January 24 biopsy revealed the presence of the embryos of *Trichinella spiralis*. Atrophy of the extensor muscles of the right thigh and calf muscles was noted on January 29; nystagmus was also present for the first time. The patient was unsteady when she sat up and appeared to have some degree of ataxia, which, together with other findings, suggested a cerebellar lesion.

Case VI

A 36-year-old labourer became ill on January 4, 1941, with severe persistent headache and irritability. He avoided conversation with others, resented being disturbed, and retired to bed on account of general weakness. On the 9th he was told that his face was swollen, and next morning he complained of heaviness of his right leg, which was swollen and puffy. Drowsiness supervened and an attack of acute gastro-enteritis lasting for twenty-four hours ensued.

On admission to hospital on January 14 difficulty was experienced in obtaining an accurate history owing to the mental torpor which existed; cerebration was slow, the memory was impaired, and the patient, who appeared to be somewhat bewildered, wore a strange and puzzled expression. He was lethargic, drowsy, disoriented, and his speech was rambling in character. Haemorrhages into the distal end of the finger-nail beds taking the form of crescentic bands of ecchymosis were noted, together with conjunctival haemorrhages and oedema of the eyelids and the right leg. The temperature was 101.4°, the pulse rate 112, and respirations 20; the urine contained abundant albumin, and muscle tenderness was detected in the arms, calves, shoulders, and the right intercostal spaces. Good muscle power was present in both arms, some incoordination of the right arm was shown by the finger–nose test, and with the exception of the right biceps-jerk all arm reflexes were absent. The knee-jerks were sluggish, the plantar reflexes normal, and the muscle–joint sense was somewhat impaired in both legs. The heel–knee test revealed slight incoordination in the right leg, and Kernig's sign was positive on both sides.

Lumbar puncture revealed colourless fluid, scanty lymphocytes in films—1 cell per c.mm.—chlorides 700 mg. and protein 20 mg. per 100 c.cm., and globulin within normal limits. A search for the larvae of *Trichinella spiralis* in the cerebrospinal fluid was unsuccessful. During the first week in hospital constipation was marked and the tongue was dry; the mental confusion continued, the headache gradually diminished, and the mild pyrexia subsided; urinary incontinence occurred on two occasions. Biopsy of the pectoral muscle was performed under local anaesthesia on January 27 and the coiled-up embryos of *Trichinella spiralis* were identified.

Case VII

On January 18, 1941, a married woman aged 36 years was seized with pain in the right loin which travelled into the right side of the abdomen and then became generalized. The pain persisted, and vomiting occurred on January 20 and continued. On the next day severe supra-orbital headache developed, accompanied by knife-like pains down both sides of the face; the face became slightly swollen, leg pains appeared, but there was no diarrhoea. She was admitted to hospital on January 23, and was said to be suffering from pyelitis.

The temperature was 102°, pulse rate 120, respirations 18, and there was pronounced tenderness, with some degree of resistance, in the right loin and lower abdomen. Slight oedema of the eyelids and mild injection of the conjunctival vessels were observed; muscle tenderness was present in the calves and shoulders, but there was no paresis. Leg reflexes were normal, but all the arm reflexes were diminished. The urine contained a trace of albumin, a few pus cells, and very scanty *B. coli*: these findings did not appear sufficient to account for the illness, and questioning failed to elicit any urinary symptoms. Puffiness of the eyelids and conjunctivae became more marked during the first two days in hospital, and the temperature returned to normal by lysis four days after admission. The leucocyte count revealed an eosinophilia of 24%.

Table enumerating the Leucocytes

Case	Date	White Cells per c.mm.	Polymorphs %	Lymphocytes %	Eosinophils %	Monocytes %	Basophils %
I	31/12/40	5,200	63	26	8	3	
	9/ 1/41	9,600	64	25	7	4	
II	31/12/40	14,800	73	13	11	3	
	9/ 1/41	11,600	73	19	8		
III	30/12/40	19,400	85	12	2	1	
	9/ 1/41	6,100	57	39	1	3	
IV	31/12/40	12,000	79	14	7		
	9/ 1/41	12,400	68	27	3	2	
V	30/12/40	11,800	84	12	3	1	
	9/ 1/41	9,200	70	20	9	1	
	23/ 1/41	15,000	43	22	33	1	1
VI	15/ 1/41	16,400	43	6	49	2	
	27/ 1/41	11,600	74	16	5	3	2
VII ..	27/ 1/41	12,000	61	13	24	2	

Summary and Conclusions

Seven cases of acute trichiniasis presenting atypical features have been described and attention has been drawn to the manner in which this disease may simulate nephritis,

uraemia, tuberculous meningitis, and pyelitis. The outstanding symptom in all cases was oedema of the eyelids, and this, in conjunction with the presence of eosinophilia, may be regarded as diagnostic. The abnormal mental state appears to have been inadequately described in the past, and is worthy of special note. Haemorrhages into the conjunctivae and nail-beds constitute strong supporting evidence, and these signs appear to be attributable to larval embolism. Definite indications of involvement of the central nervous system were observed, and in one case the clinical signs suggested a cerebellar lesion, possibly also of embolic origin. Muscle tenderness was present in most cases, and a surprising feature was the existence of constipation, which was exceedingly troublesome and resulted in faecal impaction on one occasion.

I desire to express my thanks to Dr. J. H. Sheldon, consulting physician, New Cross Hospital, Wolverhampton, for his co-operation and help; to the resident medical officers for their clinical assistance; and to Mr. K. R. Vasey.

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TRICHINIASIS IN HERTFORDSHIRE

BY

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AND

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The following brief account of some cases of trichiniasis recently diagnosed in Harpenden, Herts, may be of service to others called upon to recognize this disease.

Information that trichiniasis had appeared in this country reached one of us on February 1; in the practice of the other there had been several cases presenting unusual features, of which the most arresting was oedema about the eyes. A connexion between these facts was suspected, and blood films from two of the cases were examined forthwith. Each showed an extreme eosinophilia. Five typical cases were then investigated further. Their clinical histories are as follows:

Case Histories

Case 1.—Female aged 44. Had been feeling ill for three days before January 23, when she first noticed puffiness of the eyes and had general muscular pains; she also complained of severe temporal headache. On January 24 her temperature was 101° and her pulse 100; she had a harsh barking cough and marked oedema of the eyelids. Physical examination revealed nothing else abnormal, and there was no albuminuria. Fever of 99° to 101.6° has now persisted for sixteen days: muscular pain, chiefly affecting the calves of the legs, neck, and shoulder girdle, is now diminishing. She also complains of vague abdominal discomfort, sometimes amounting to pain.

Case 2.—Male aged 36. Onset on January 21 with swelling of the eyelids and face, temporal headache, and pain, particularly in forearms and legs. No abnormal physical signs except muscular tenderness; no albuminuria. Fever persisted for three or four days, muscular pain for about ten days, accompanied later in the forearms by oedema. Recovery complete in a fortnight.

Case 3.—Female aged 34, the wife of the foregoing patient. Had an illness with identical features at the same time, but was less ill; continued her ordinary life, and was neither examined nor treated.

Case 4.—Male aged 53. Onset on January 31, with oedema of the eyelids; no headache and no muscular pain. On February 1, temperature 100°, well-marked oedema of the eyelids; physical examination otherwise negative; no albuminuria. Temperature since has varied between 99.6° and 101.6°, and some muscular stiffness and a feeling of ill-being have developed: this attack has now lasted eight days and continues.

Case 5.—Female aged 44. Had a headache for two days before January 21, when her eyes became puffy and she had pain in the muscles of the neck, arms, and legs, and some vague abdominal discomfort. First seen on January 23, when she had a temperature of 100° and marked oedema of the eyelids. Physical examination negative; no albuminuria. Pain and a feeling of ill-being lasted for ten days, by which time the oedema had also nearly subsided. She was quite well within a fortnight.

Pathological Investigations.—Differential leucocyte counts gave the following results:

	No. of Days since Onset	W.B.C. per c.mm.	Percentage of Eosinophils	Eosinophils per c.mm.
Case 1 ..	12	13,400	28	3,752
Case 2 ..	14	8,000	27	2,160
Case 3 ..	14	11,600	27.5	3,190
Case 4 ..	5	12,000	31	3,720
Case 5 ..	14	17,800	47	8,366

There was thus a pronounced eosinophilia in all cases, although in one the duration of the disease had been only five days, and in three the attack had been brief and was clinically over when the counts were made.

Muscle biopsy was performed in three cases, small pieces of the deltoid being removed for us under local anaesthesia by Mr. Michael Harmer, whose help we gratefully acknowledge. In Cases 2 and 5 no embryos were present, but a single coiled embryo lying among the fibres was discovered in the specimen from Case 1. These examinations were made on the same day of the disease as the blood counts.

In Case 4, the most recent, two stools passed after 4 grains of calomel were examined for adult worms with no result, and in 10 c.cm. of blood lysed in an excess of distilled water and centrifuged no embryos were found.

Dietetic History.—All these patients could recollect having eaten sausages during the fortnight preceding the onset of their illness. Two of them had been in Birmingham and one in London during this period, and might have acquired the disease there; but its local origin is certain in Case 5—this patient having had no meals away from home—and particularly in Case 3, which patient had not only been continuously at home but had admitted having eaten two locally bought sausages *raw* on or about January 14. Her husband, Case 2, ate four of the same sausages cooked.

Other Cases.—One of us (D. M.) has seen several similar cases, all during the last three weeks of January, in which no laboratory investigations were made. We mention in passing that one of these patients gave blood for transfusion on the day before his illness became noticeable: the number of embryos so transmitted would be small, but it should presumably be recognized as inadvisable that anyone suspected of having trichiniasis should act as a blood donor. It is not assumed that these were necessarily cases of the disease, and, indeed, we have reason for believing that the features of mild trichiniasis may be imitated by some other condition. A man complaining of fever and headache, who three days later developed conjunctival oedema but no muscular pain or other complaint, had an eosinophil count of only 132 per c.mm. on the sixth day after the onset. He had eaten sausages on several occasions, and his may be a case of trichiniasis in which eosinophilia has failed to develop. This explanation is almost impossible in another case under the care of Dr. K. H. C. Hester, to whom we are indebted for permission to mention it. She is a woman aged 48 who has developed marked oedema of the eyelids in association with a febrile illness having no other localizing features except upper respiratory tract catarrh. Not only is her eosinophil count merely 56 per c.mm., but she is a strict vegetarian, and close questioning has brought to light not even the possibility that she might have consumed meat in a sandwich without knowing what it was.

Commentary

The finding of a trichinella embryo establishes the diagnosis in Case 1 and thus proves the existence of the disease in this locality. The other four cases are clinically similar, and all exhibit an eosinophilia of the same order. There is no other febrile disease of such duration in which an eosinophilia of this degree occurs: during a known epidemic an eosinophil count of over 2,000 per c.mm. in any case with the clinical features of trichiniasis is almost certainly diagnostic.

A detailed analysis of the clinical features of so few cases is not called for, but the following points may be noted. The only constant feature is oedema of the eyelids, and maximum stress should be laid upon this in encouraging the search for further cases, although, as we have suggested, this sign should not be taken as pathognomonic. Severe headache localized just above the eyes and quite unrelieved by ordinary sedatives is common, as is a feeling of general ill-being. Muscular pain and tenderness are variable, and were accompanied in only two of these patients by recognizable oedema. Linear subungual haemorrhages were not observed. In no case was there any clear history of gastro-intestinal disturbance preceding the stage of invasion. Three of these cases were very mild, with a duration of little more than a week, and the remaining two, although of longer duration, are of only moderate severity. In such comparatively light infestation the examination of blood and stools for parasites is very likely to be fruitless. The same may be said of muscle biopsy unless the specimen is of adequate size and taken from a carefully chosen site. Out of consideration for patients who submitted to this operation rather in the public interest than for any benefit to themselves, the incisions made were small and the fragment obtained amounted to not more than about 0.1 gramme of muscle. Were we faced again with the need for proving the existence of this disease, we should advocate identifying a point of maximum tenderness, which is usually found near a tendinous insertion, and the excision therefrom of a strip of muscle at least 1 cm. long.

The source of the infested meat which must have been consumed by these patients is not yet known, nor is the distribution of other cases, if any, in the neighbourhood. It is certainly not confined, as we understand it has been elsewhere, mainly to people of the artisan class; on the contrary, none of these five is an insured patient and some of them are well-to-do. The mere fact that trichiniasis exists in a locality so remote from Wolverhampton—the principal area known at the moment to be affected—appears worthy of immediate record, since it strongly suggests that further cases may be recognized elsewhere as soon as their possibility becomes known.

We are indebted for confirmation of the diagnosis by muscle examination to the Institute of Agricultural Parasitology, St. Albans, which is the consulting laboratory for parasitology to the E.M.S.

J. L. Thorner (*Arch. Pediat.*, 1940, **57**, 437) records an abortive attack of measles in a female infant whose mother did not develop measles until nineteen days after delivery. As the mother had been nursing the child not only during the acute stage of the attack but also during convalescence, it was hoped that antibodies had been transferred through the milk, but to insure attenuation 15 c.cm. of whole blood was injected intramuscularly and only an abortive attack of measles ensued. Measles during the first six weeks of life is uncommon, but previous examples have been recorded by Musser (1927), Kohn (1933), Cogne (1924), and Ronaldson (1926).

Clinical Memoranda

Neurological Complications of Serum Therapy

The publication of the article on neurological complications of serum therapy by Drs. Thompson and Tombleson in the *Journal* of June 22, 1940 (p. 1015), prompts me to record my own personal case.

CASE REPORT

On June 3 or 4, 1939, I had a severe attack of dysentery. On the first day microscopical examination of my stools revealed plenty of Charcot-Leyden crystals, but no amoebae or cysts: characteristics of bacillary dysentery stools were not found in it. Moreover, I had had definite amoebic attacks once or twice before. Amoebic infection was diagnosed and injections of emetine hydrochloride were given, but there was no improvement after three 1-grain injections. Further examination of the stools revealed a bacillary infection; cultural examination was not done. Anti-dysenteric serum was then suggested. I generally test a patient's sensitivity to serum by giving him a very small preliminary dose intradermally, and I asked my attending physicians to test me in that way beforehand. The test was done; a little while after the test a big local wheal and very scratchy urticarial rashes broke out all over my body. Seeing that I was hypersensitive I refused to have the serum. During the next two or three days my symptoms did not abate with medicinal treatment and I lost a good deal of blood with stools; consequently it was decided that I must have serum. On June 12 the first dose (20 c.cm.) was injected subcutaneously in my right thigh, the only untoward effects being extensive and itchy rashes all over the body. On the 13th I had another dose of 20 c.cm. No rashes appeared, and I began to show signs of improvement. On the 14th I was practically cured, and felt very well. I went out on the 16th to see an urgent case.

On the 17th extensive rashes again appeared. I took a calcium injection and remained indoors for two days. On the 19th I had to go out to see some cases. Throughout the whole day I felt well, but in the afternoon had some malaise, with stiffness all over the body, just as before an attack of influenza or malaria, and I thought that a little exercise might help to pass it off. During a game of badminton I felt great pain in my back between the shoulder-blades; it radiated over both the shoulders and down the arms and forearms. I had to stop, and went to bed after taking a couple of aspirin tablets. The night passed without much trouble. The next morning I felt better except for some pain in the shoulders and arms. I visited my hospital patients as usual, but suddenly felt an excruciating pain between the shoulder-blades, radiating over both shoulders and down the arms. This completely incapacitated me. I was driven home very slowly and gently, as the slightest jerk aggravated the already excruciating pain to such an extent that I thought I would die before reaching home. A doctor was immediately sent for, and on arrival he gave me 1/4 grain of morphine, which alleviated the pain slightly. I was confined to bed for three weeks, suffering extreme agony, unrelieved by anything but morphine, which had only a slight and temporary effect. For a few days my temperature rose a little, and I was delirious for many days, mostly at night (a confused state of mind lasted for about six weeks). Within a week of the first appearance of symptoms the muscles around my shoulders, especially of the right—the deltoid, supraspinatus, upper parts of biceps, and triceps—had shrivelled up to such an extent that the right shoulder and the upper part of the right humerus were left covered by mere skin and a few fibres of muscles, which could be felt like strands of thread on the bone. The supinator muscles of the forearm and the first dorsal interosseous of the palm were also more or less shrivelled up. All these muscles of the left arm were affected, but to a much less degree than those of the right. My right arm became completely paralysed, but the left could be moved with difficulty. There were patches of anaesthesia, hyperaesthesia, and paraesthesia on the skin of both the upper limbs. The left vocal cord was also affected. All these paralyses, and the atrophy of the muscles, occurred within a week or ten days. The pain was

intense, with but slight remission from time to time, and I hardly had any sleep for three weeks, during which period I lost nearly 3 stone.

At this stage I was transferred to Calcutta, a distance of 475 miles, for a course of hospital treatment. My pain did not abate for another three weeks, and only morphine gave the slightest relief. At this time cobra venom was tried. The first dose was injected probably on August 1, 1939, and this had a magical effect. Pain abated and I slept straight off for some hours. Thereafter the pain returned off and on, but the severity and duration grew gradually less, and I made an uneventful recovery. I was discharged from hospital by the middle of September, but had electrical treatment and massage for a further month in the out-patient department before returning home. Partial paralysis of both arms and of the vocal cord still persisted when I was discharged. At this time I could raise my arms only up to the shoulders; the atrophied muscles had grown, but were still far from their normal size, and my voice, though much better, was very weak and could be heard only by those near me. At the time of my discharge the specialists said it would be at least six months before my voice was restored (as my left vocal cord was still completely paralysed) and the atrophy and paralyses of my arms would disappear. Here I cannot help mentioning the interesting fact that after my discharge from hospital an ayurvedic practitioner took me in hand, and in less than three weeks my voice was completely restored and my arms got so much better that I could raise them straight to the sides of the head, though with some difficulty; other arm movements still remained restricted.

After nearly fifteen months I still occasionally feel some pain around my right shoulder and arm. A small portion of the posterior part of the right deltoid muscle has not yet fully regenerated, but the movements of the arms are practically normal. A sense of constriction round the right arm (as if a tourniquet was tightly wound round the limb spiral fashion from the shoulder to the finger-tips) and a sense of congestion and actual slight solid oedema of the skin of this arm, which were present from the onset of the disease, still return from time to time.

I may mention that this was the first occasion on which I had been treated with serum.

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Fatal Anuria following Sulphapyridine in Pneumonia

The admission to No. 4 General Hospital, B.E.F., of the case described below occurred shortly before the hurried evacuation of that unit from France, and it is regretted that as a consequence investigations were incomplete and records are deficient. It is felt nevertheless that, in view of its rather unusual nature, an account, however incomplete, may be of some value.

A necessarily brief review of the literature on the subject has produced few comparable cases of complete anuria following the administration of sulphapyridine, though the occurrence of haematuria seems to be not uncommon.

CASE RECORD

A lieutenant aged 42 was admitted to hospital on June 10, 1940. He stated that, except for some bronchitis, he had been in good health until a few days previously, when during a train journey from the North of France he developed a pain in the right chest, not apparently severe at first. On the following day he had a severe pain in the right lumbar region lasting for fifteen minutes. On the day before admission the pain in the right chest recurred at frequent intervals, and was accompanied by shortness of breath. His temperature that evening was 100° F. On the morning of the day of admission his temperature was stated to be 99° F., he was short of breath, and he coughed up a small amount of blood-stained sputum.

On admission the patient's temperature was 100° F., the pulse 104, and respirations 24. He was a rather fat flabby man with ruddy complexion, not cyanosed and not very distressed, though respiration was slightly grunting. There were dullness, diminished air entry, and bronchial breathing at the right base behind; the lungs were otherwise clear. The pulse was full, bounding, and regular. It was apparently a case of lobar pneumonia. He was put on sulphapyridine at once—3 grammes at 6 p.m., 2 grammes at 10 p.m., and thereafter 1 gramme four-hourly. He was also ordered half an ounce of whisky every four hours as he admitted to a moderate consumption of alcohol, and his appearance corroborated this. On the following morning his general condition had improved and his temperature was normal, though there had been some vomiting. In the afternoon he complained of severe pain in the lumbar region and passed a small amount of heavily blood-stained urine. The administration of sulphapyridine was stopped at once, a total of 10 grammes having been given, but the loin pain necessitated morphine for its relief. He passed a poor night, but the next morning (June 12) he had no pain and his general condition was good. He had passed no more urine, but the bladder was not palpable. His blood pressure was 170/110 mm. Hg and his fundi showed no changes. Fluids were pushed and citrates administered. Passage of a catheter produced only a drachm of thick bloody urine.

On June 13 he developed pleural friction over the back and front of the right base and had still passed no urine. He had no headache, was mentally clear, and his general condition was still good. Fluids were still being pushed, and potassium citrate was increased to 40 grains every two hours. A hot pack was applied, resulting in profuse sweating, and during the night one pint of 4.2% sodium sulphate was given intravenously, without effect on urinary secretion.

On June 14 a few drops of bloody urine were passed containing a heavy crystalline deposit, which was proved to be composed of acetyl-sulphapyridine. His blood urea was then 155 mg. per 100 c.cm., and his condition was deteriorating. He was seen by Major-General R. Priest, Colonel Stott, and Colonel Max Page, and it was decided that decapsulation of the kidneys offered the only chance of survival.

The operation was performed by Lieut.-Colonel Porritt and Major D'Abreu. On exposure the kidneys were found to be enlarged, lobulated, and oedematous. No calculi were felt. The capsules stripped easily. The pelves were bluish in colour from the contained dark blood-stained grumous urine. A drainage tube was put into the pelvis of the right kidney. Small portions of each kidney were excised for section, but owing to the upheaval of the hurried evacuation it was not possible to complete the examination. The patient was returned to bed and a continuous intravenous drip-transfusion instituted. Practically no urine was passed from the pyelostomy tube, and death occurred at 10 p.m. on June 15.

CONCLUSIONS

In view of the failure of the pyelostomy to promote re-establishment of urinary secretion it is probable that the anuria was due to blockage of the renal tubules themselves and that the procedure of ureteral lavage, successfully carried out by Carroll *et al.* in a case of theirs, would have been useless at the stage at which operation was done. The total amount of sulphapyridine given was small, and the initial dose was no larger than in a number of other cases of pneumonia in which no urinary complications supervened. It is not clear what was the particular factor which induced the copious crystallization of the sulphapyridine in this case, but the unfortunate termination emphasizes the paramount importance of adequate fluid intake during the administration of sulphapyridine in all cases, especially when any suspicion of renal insufficiency exists. It is regrettable that a urine examination was not made on admission here.

Thanks are due to Major-General R. Priest, Colonel Stott, and Colonel Max Page for their most valuable advice, and to Lieut.-Colonel Porritt and Major D'Abreu for their surgical co-operation. I wish also to thank Colonel D. G. Harding, O.C., No. 4 General Hospital, B.E.F., for permission to present this article for publication.

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Reviews

TREATMENT OF CANCER

Treatment of Cancer and Allied Diseases. Edited by George T. Pack, B.Sc., M.D., F.A.C.S., and Edward M. Livingston, B.Sc., M.D. In three volumes. ($36.00 or £9 the set.) New York and London: Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers.

To describe the treatment of cancer and allied conditions in all its various aspects and in all parts of the body is a task which really merits the use of that overworked adjective "colossal"; nevertheless it has been attempted and carried through in a praiseworthy manner in the books now under review. It is not surprising, therefore, to find that the three large volumes contain some 2,600 pages of matter, while the indexes alone add more than 200 pages to this total.

The general editorship is in the hands of George T. Pack and Edward M. Livingston, and the list of contributors contains 150 names of authors, many of them with international reputations. From such a galaxy we can only pick upon a few for mention, but the following names carry their own significance: Adson, Balfour, Braasch, Broders, Chaoul, Coley, Crile, Ewing, Gwathmey, Handley, Jackson, Lahey, Mayo, Polya, Rankin, Young; yet the other names in this long list are scarcely less imposing. A high general standard of information would naturally be expected from such sources, and a perusal of the various sections shows that our anticipations are justified. It is obviously impossible in a short review to examine each section critically, but mention can be made of a few to indicate the character of the work.

An early chapter on the microscopical grading of cancer affords an excellent opportunity for Broders to explain his investigations on this subject; others on surgical, aspiration, and punch biopsy are full of practical information. Several good chapters are devoted to the general theory and application of radiation therapy in all its forms, including the Chaoul tube on the one hand and the use of very high voltage installations on the other. Quite properly the question of protection in radiotherapy receives adequate attention. Following these discursive sections the rest of the book deals regionally with cancer of the various organs. In each section the description of treatment is comprehensive, and includes surgery, diathermy, irradiation in all its forms, and, where appropriate, other forms of treatment such as Coley's fluid, etc. Even such matters as the prosthetic reconstruction of the face and mouth following cancer therapy are not neglected.

On the whole it seems that the balance between the various methods of attacking cancer in any particular situation is well held, and in the few instances where the authors' opinions do not agree, as is bound to occur in a book of this type, the editors have added some judicial paragraphs to guide the reader. The combined knowledge and skill here represented could not possibly come within the range of one man's ability, but the multiple authorship occasionally leads, despite efficient editing, to a certain amount of overlap. In particular this is noted in the sections on growths of the colon and rectum. There are some 1,500 illustrations, the high quality of which is equalled by the general make-up of the volumes. The publishers as well as the authors are to be congratulated upon their enterprise in producing a notable contribution to the cancer problem, and, provided the matter can from time to time be brought up to date, these volumes should be universally recognized as a standard of reference in this subject for a long period to come.

HANDBOOK OF ANAESTHETICS

Handbook of Anaesthetics. (Formerly Ross and Fairlie.) Fifth edition. Revised by R. J. Minnitt, M.D., D.A. With Chapters on Local and Spinal Anaesthesia by W. Quarry Wood, M.D., Ch.M., F.R.C.S.Ed. (Pp. 364; illustrated. 12s. 6d. net, postage 7d.) Edinburgh: E. and S. Livingstone. 1940.

In his preface to the fifth edition of Ross and Fairlie's *Handbook of Anaesthetics* Dr. R. J. Minnitt drops a broad hint that he means to do a good deal of sweeping before the sixth edition appears but is rather acutely conscious of being a new broom this time. His difficulty is one with which it is easy to sympathize: for he has to bring up to date an elementary textbook (usually more difficult to write than an advanced one) which has achieved a recognized position through the possession of several real and obvious merits. Among these were clear presentation of accurate information, good selection of what must be included and what omitted in a book of limited scope, and good arrangement of material. In the present evidently transitional stage of development it would be better not to offer criticism of things which Dr. Minnitt probably himself realizes are open to it, but to dwell rather on the substantial merits both of what he has inherited from his predecessors and what he has added to it.

Naturally some unevenness of style is observable: many chapters are almost models of well-expressed dogmatic teaching; others are rather full of grammatical solecisms such as "the patient is induced with . . ." (shade of Clifford Allbutt!) when what is meant is "anaesthesia is induced by . . ." The chapter on choice of anaesthetic for various types of case would gain by references to spinal and to local anaesthesia, which are virtually omitted from purview; and it may be suggested also that there are other causes of mechanical obstruction of the airway besides obstructive goitre, oedema of the glottis, and chest affections. Dr. Minnitt knows that well enough, of course, but students reading page 250 might not realize it. It is of no great intrinsic importance that novocain is not spelt with the final "e" which it is regularly given here, but this is a symptom of the rather perfunctory proof-reading which is doubtless on Dr. Minnitt's list of things to be remedied. The book is so valuable that it cannot be very long before "next time" comes about.

FOOD AND DIETETICS

Hutchison's Food and the Principles of Dietetics. Revised by V. H. Mottram, M.A., and George Graham, M.D., F.R.C.P. Ninth edition. (Pp. 648. 21s. net.) London: Edward Arnold and Co. 1940.

The ninth edition of Sir Robert Hutchison's "Food and the Principles of Dietetics" has been edited and extensively revised by Prof. Mottram and Dr. George Graham. Its contents fall into four parts. Part I deals with diet in normal life, and in the space of 184 pages an excellent account is given of the physiology of nutrition. Part II deals with the composition and character of food and beverages, and a vast amount of valuable information will be found in the 260 pages which comprise this section. No greater compliment can be given than to say that the section fully maintains the high standard which has made Hutchison's monograph one of the leading books on diet in this country for the past forty years. There next follows an excellent account of the principles of feeding in infancy and childhood by Dr. C. F. Harris.

The final section is mainly concerned with the dietetic treatment of disease. To the general practitioner this aspect is of particular importance, and he may well be disappointed that the editors should devote less than one-sixth of a book on dietetics to the part played by diet in the treatment of disease. Surely the value and the

limitations of diet in the various types and stages of the chronic rheumatic diseases and diseases of the heart and blood vessels and the liver and biliary tract are worthy of more space than the one or two pages devoted to them. This section does not reach the high standard attained by the rest of the book.

ACTIONS OF DRUGS

Pharmacology. By J. H. Gaddum, Sc.D., M.R.C.S., L.R.C.P. Oxford Medical Publications. (Pp. 407. 17s. 6d. net.) London: Oxford University Press. 1940.

Prof. Gaddum in the preface to his new textbook entitled *Pharmacology* explains that his object has been to present the general principles of the subject in a brief form to medical students. This task is one beset with great difficulties because pharmacology has developed along empirical lines, and in consequence an enormous mass of detailed information has been acquired, whilst general principles are scarce. Furthermore, the medical student is interested in a small number of compounds that have been chosen on account of their therapeutic value and not on account of their general pharmacological interest.

The volume comprises about 400 pages, and the author has dealt with all the chief drugs of therapeutic importance, hence his main problem has been that of selecting the most relevant data and presenting them as clearly and concisely as possible. The difficult problem of demonstrating the relations between different members of groups of compounds has been overcome by the use of ingenious tables which show the variations in structure very concisely and clearly. This method is applied to such groups as the sympathomimetic amines, the phenol derivatives, and the sulphonamide drugs. The volume covers all the important aspects of drug action, and certain sections provide information that is not readily available elsewhere in a concise form; such sections are those dealing with the action of drugs on nerve endings and the principles of biological assay.

The special interest of Prof. Gaddum's book is that it represents an approach to pharmacology from an unusual standpoint, and hence can be recommended not only to students but also to teachers of pharmacology and therapeutics.

CHILD PSYCHOLOGY FOR PROFESSIONAL WORKERS

Child Psychology for Professional Workers. By Florence M. Teagarden, Ph.D., Professor of Psychology, University of Pittsburgh. (Pp. 641. $3.25.) New York: Prentice-Hall, Inc.

Prof. Teagarden has produced a really valuable book. Primarily designed for professional social workers, teachers, and nurses who have to work among children, whether in school, home, or institution, this volume will prove to be a mine of information for anyone interested in the life of the child. Its great merit is that it is centred on the normal and not on the abnormal child, and that the author has succeded in avoiding the worst of the psychological jargon of the present day.

In a comprehensive study such as this much of the information is of necessity second-hand, and this is perhaps noticeable in the writing of the first few chapters, which deal with heredity, birth, and infantile development; but by the time the author reaches the chapters on the pre-school child and his progress through school life she has clearly come within the ambit of her own experience, and the book accordingly comes to life. The chapter in which behaviour difficulties are surveyed is especially good, while those chapters concerned with the effects of various illnesses and sensory and physical defects are adequate if not detailed. Finally, a record of the children's charter as promulgated by President Hoover's White House Conference on Child Health and Protection is given: this might well be used as an ideal by all those concerned with the education of children in its widest sense. Although this book is meant primarily for a non-medical audience, doctors, in whatever branch of the profession they may find themselves, would do well to read it; for if we have any interest in our patients' welfare—which surely we must have—we all must come back to the proper upbringing of the child as the basis of healthy living.

Notes on Books

The latest of several recent popular books on medical microbiology is Dr. JOHN DREW'S *Man, Microbe, and Malady*, which has appeared in the sixpenny Pelican series. It is quite the most systematic and orthodox of its kind, and the inquiring and intelligent laymen will profit much by reading it. The arrangement and choice of subjects almost follow the lines of a regular textbook, but the author maintains interest by the use of simple language and by allowing facts to speak for themselves. The chapter on bacterial warfare is a novelty, and the reader will be relieved to hear that there are grave difficulties in the way of attacking effectively by this means. This is true, but there may be other methods which have not occurred to the author, and it would be rash to predict their failure in advance of any practical trial.

Occupational therapy has not received the attention in this country which it deserves. It is fairly well recognized in mental hospitals, and the few centres which teach it approach it chiefly from the point of view of psychiatry. It has, however, an invaluable scope in the after-treatment of nearly every form of disease. In the rebuilding of mind and spirit which is so necessary after most illnesses the lessons of the mental hospital can be usefully applied. In rehabilitation after orthopaedic injuries occupational therapy is a highly specialized art, for its application differs from limb to limb and even from case to case. Dr. NORAH A. HAWORTH and Miss E. MARY MACDONALD have written the first English textbook on the subject, which has for some years been fruitfully developed in Canada. Their *Theory of Occupational Therapy* (Baillière, Tindall and Cox; 6s.) is intended for students and nurses, and embodies a great deal of practical experience by well-known pioneers. They deal concisely with the treatment of mental patients, sufferers from tuberculosis and cardiac disease, and surgical and orthopaedic cases, and conclude with a practical chapter on finance, equipment, and the ancillary details of the art. The book is copiously illustrated with photographs and line drawings.

Preparations and Appliances

REFINED TETANUS AND GAS-GANGRENE ANTITOXIN-GLOBULINS

Mixed tetanus and gas-gangrene antitoxin is issued for the convenience of those who are called upon to treat wounds contaminated with soil, dust, etc., and is available as "Wellcome" brand refined tetanus and gas-gangrene polyvalent antitoxin-globulins. Each phial contains 3,000 international units of antitoxin for *Cl. tetani*, 3,000 units for *Cl. perfringens* (= *Cl. welchii*), 1,500 units for *Cl. septique*, and 1,000 units for *Cl. oedematiens*. These amounts are in accordance with the provisional recommendations of the Ministry of Health Emergency Medical Service for the serum prophylaxis of tetanus and gas gangrene (*British Medical Journal*, 1939, **2**, *Supplement*, p. 169). The entire contents of the phial may be injected subcutaneously or intramuscularly as soon as possible after receipt of a wound that may have been infected with pathogenic anaerobes.

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TRICHINIASIS IN ENGLAND NOW

Following our editorial warning last week (p. 202) that trichiniasis exists in this country, we publish this week at page 237 an account by J. E. S. Lee of the disease as seen at the present time in Wolverhampton. A description by J. H. Sheldon of the same outbreak appears in the current issue of the *Lancet*. Suspicious cases were first seen in the middle of December last, and soon afterwards some of the more severe were admitted to hospital. The nature of what was evidently a distinct and unfamiliar disease entity was finally determined by the demonstration of *Trichinella spiralis* embryos in a piece of excised muscle. Some 500 cases have occurred in this district, and, although some of them have been severe, there have fortunately been no deaths. The clinical picture departs from the usual description in several ways. During the first week after consuming infected meat vomiting, diarrhoea, and upper abdominal pain are said to be characteristic: in these cases they were often completely absent; according to Sheldon only 10% had vomiting and 5% diarrhoea, the majority being constipated, sometimes severely. The absence of prodromal gastro-intestinal disturbance is therefore not a point against the diagnosis, and symptomatic recognition must depend mainly on the features of the stage of invasion. The first of these is usually swelling of the eyelids, accompanied by severe frontal headache; a few days later involvement of the skeletal muscles usually causes pain, tenderness, and stiffness. These effects are very variable, ranging from complete absence in slight cases to a condition said to be worse than labour pains, and causing such stiffness that patients have said they "might have been plaster statues"; the duration of muscular symptoms also varies from a few days to five weeks. A prominent and unusual feature in this epidemic has been evidence of involvement of the nervous system, and this of several kinds. Some cases present the picture of meningitis, with head retraction, semiconsciousness, irritability, photophobia, a meningeal cry, a positive Kernig sign, and extensor plantar responses. Others are deeply lethargic, depressed, and even deluded. Finally, no fewer than thirteen out of seventy-six cases (17%) described by Sheldon have presented signs of focal cerebral lesions, in the form either of monoplegia or of ataxia. Not only may these nervous manifestations complicate a severe and otherwise typical case, but in some giddiness, weakness, and ataxia have been the first manifestations, even preceding the swollen eyes. The general picture is therefore highly complex, and consideration of trichiniasis may be necessary in the differential diagnosis of a large variety of conditions. Fortunately the true nature of the disease seems to be invariably betrayed within the first few days if not at the very onset by oedema of the eyelids—an absolutely constant sign which in the absence of albuminuria calls for a differential leucocyte count; a marked eosinophilia almost certainly establishes the diagnosis. This blood change may apparently develop late, and was equivocal in degree in some of the cases described by Lee. It would be useful to do repeated counts on a series of cases diagnosed early in order to define more exactly what blood picture is to be expected at each stage. Of the various methods of positive diagnosis by demonstration of the parasite, according to D. L. Augustine,[1] concentration of the blood for embryos and searching the stools for adult worms so often yield no result as to be a waste of time; muscle biopsy may also fail to reveal embryos in a lightly infested case. This author recommends the use of an antigen prepared from embryos both for a skin sensitivity test, which becomes positive during the second week, and a serum precipitin test, first applicable during the fourth week. Since both these reactions persist for a year or more they would serve admirably for ascertaining the full extent of an epidemic during its later stages or even after it is over, as well as for confirming the diagnosis in individual cases. An improved method for preparing the antigen has recently been described by J. Bozicevich.[2]

We also publish a short account by L. P. Garrod and D. MacLean of further cases of trichiniasis which have been diagnosed in Hertfordshire since the existence of the disease in this country became known. This minor but significant incident perhaps illustrates the consequences which may accrue to the public health if E.M.S. laboratories are looked upon not merely as sources of reports on specimens but as consultative centres for epidemiological problems. The extent of the disease in this area is not yet known, but five comparatively mild cases have so far been diagnosed, each presenting a typical clinical picture and having an eosinophil count of over 2,000 per c.mm.; the embryo has been found in muscle from one case. The importance of these few cases lies of course in the fact that they appear unlikely to be connected in any way with the Wolverhampton outbreak, and the recognition of the disease in another area raises the possibility that it may be widespread. It is incumbent on practitioners throughout the country to be on the look-out for cases having these features, and to call in laboratory aid whenever the disease may be suspected.

Until the extent of the disease is fully known it cannot too strongly be urged that all pork and pork products should everywhere be thoroughly cooked. Sausages are chiefly suspect, and it does not seem to be generally known that the meat they contain has usually not been cooked at all, nor are all physicians perhaps aware that eating raw sausage is a common habit. The piece of social research in this connexion described by Sheldon produced astonishing results. As soon as this habit was recognized as a factor in the Wolverhampton outbreak, all patients were asked about it, and of the next fifty-nine seen thirty-seven confessed to it. It was also found to explain the peculiar sex incidence: sixty-two of Sheldon's patients were females and only fourteen males. Apparently working-class women content themselves with raw sausage either because it is a tasty and portable lunch to take to a

[1] *New Engl. J. Med.*, 1937, **216**, 463.
[2] *Pub. Hlth. Rep.*, Wash., 1938, **53**, 2130.

factory, or, if they are married, because housework leaves them no time or inclination to prepare a proper meal; their husbands, on the other hand, expect things to be cooked for them. A warning against the dangerous practice of eating raw sausage should be sounded throughout the length and breadth of the land.

OVERHAULING ASEPTIC TECHNIQUE

At a congress of the American College of Surgeons held in October, 1939, the proceedings of which have only recently been reported,[1] post-operative infections and the measures by which they can be prevented were discussed from almost every possible point of view. The mere fact that this subject was chosen for so prolonged a debate acknowledges that perfection in aseptic technique has not been generally reached; what was said on some aspects of it suggests rather there is much room for improvement. This report forms an interesting corollary to the paper by Prof. A. A. Miles and his colleagues which we published a few weeks ago,[2] for both deal with different aspects of the same subject. The study initiated by the War Wounds Committee of the Medical Research Council has developed on lines which have shown that much preventable infection in wounds is due to imperfections in ward technique; it is suggested that if precautions usually taken in operating theatres were also observed in ward work the transmission of infection could be prevented. The American report, on the other hand, deals almost exclusively with theatre technique itself—that aspect of surgery which should be a model for all other proceedings undertaken in its name. Let us grant at once that theatre infections are far less common than those acquired in septic wards; the problem is not of the same magnitude. But what it does amount to can only be ascertained by accurate record-keeping, and when such a system was introduced in 1925 at the Presbyterian Hospital, New York, it was found that the frequency of post-operative wound infections was no less than 14% of all cases, 4% being serious and 10% trivial. These records have been carefully kept since then; cases have been reported weekly to the staff conference, and changes made in aseptic technique to eliminate the apparent source of infection. The incidence of infections has declined steadily, and amounted in 1939 to only 0.6% classified as serious and 2.6% as trivial.

Among measures for minimizing contamination of the wound the first recommendation made at this congress was the use of an efficient mask, which is now well known to mean one containing an impermeable layer of some such material as cellophane. Current American opinion that the air is the source of staphylococcal wound infection is reflected in several communications on the use of ultra-violet light for air sterilization; but glove perforations are not forgotten, and it is recommended both that small punctures should be more carefully looked for and that a record be kept of the numbers produced by each surgeon, with a view to persuading the chief sinners to take greater care. The patient's own skin is another possible source of wound infection, and pre-operative skin disinfection comes in for discussion here; but the recommendations made are simple and would lead no uninstructed reader to suppose that methods favoured for this purpose are legion. It is laid down that preliminary cleansing with liquid soap followed by ether and alcohol and the application of a sterile dressing should take place in the ward; for the further swabbing with ether and alcohol carried out in the theatre before the application of a mercurial or dye antiseptic minute directions are given for wiping towards the periphery in order not to transfer bacteria from the unsterile edge of the operative area to the line of incision in its centre. How important such details may be must be left to individual judgment, but it scarcely needs to be said that nothing like this amount of care is always taken over this proceeding.

"Supposedly sterile materials" are the final source of danger dealt with at this congress. Catgut, of course, has always been a problem, but the absolute and invariable sterility of instruments and of fabrics such as towels and dressings is a fundamental condition of successful surgery. It is usually assumed with confidence. Is this confidence always justified? The most detailed report in these proceedings deals with steam disinfection: it condemns the use of metal drums, and condemns the vacuum displacement of air, thereby classing as potentially inefficient probably nine-tenths of steam sterilization in theatre practice in this country. Gravity air clearance, a horizontal path for air escape, and a thermometer at the outlet which must read 250° F. before sterilization is considered to have begun are laid down as essentials. The sterilization of instruments is the subject of a paper which begins by recording the answers to a questionary on this subject sent to 207 leading hospitals in all parts of the U.S.A., producing 106 replies. The variety of practice revealed in these replies is astonishing. No fewer than sixteen different methods are used, with variations. Boiling for various periods in either water or a solution of soda and autoclaving at various pressures (temperature not being mentioned) are the most popular. Other methods of applying heat are immersion in oil at 250° F. and a hot-air oven at 170° C., which have ten advocates and one respectively. Alcohol alone in concentrations of from 50 to 95% is used at six institutions, and lysol or carbolic acid in various strengths or combinations with glycerol or alcohol in about twenty others; biniodide of mercury and "70% alcohol and soda soap" have only one advocate each. It should be understood that these are methods used for simple steel instruments: had the inquiry embraced catheters, rubber articles, and suture materials the variety of replies would no doubt have been greater. The author of this paper, E. E. Ecker, goes on to discuss a large variety of other chemical reagents which have been recommended for instrument sterilization, and seems concerned rather to deplore this lack of uniformity in practice than to advocate any particular method, although his statement that boiling in a 2% solution of soda will sterilize a soil suspension in five minutes implies that here is one answer to the problem. There is, of course, no harm in using whatever method one fancies provided that it works, but some of these do not.

[1] *Surg. Gynec. Obstet.*, 1940, **71**, 403.
[2] *British Medical Journal*, 1940, **2**, 855.

Ecker expresses the hope that the college whose members he is addressing will officially adopt standard methods for this purpose. There is much to be said for authoritative pronouncement on matters of this kind, based if necessary on a reinvestigation of the methods in use, taking account first and foremost of their dependability, but, having assured that, also of their convenience and cost. To define the best methods of sterilizing all surgical apparatus in general use would be to sweep away a vast mass of varied ritual which, apart from its merits or defects, is a burden and a source of confusion to the nurses who have to carry it out. This is no new subject: the pitfalls of steam disinfection, the inefficiency of alcohol, and the limitations of formaldehyde, for example, have all been discussed in this *Journal* in recent times, as have the new problems in sterilization constantly presented by the ever-increasing complexity of surgical apparatus and the variety of materials used. It is not too much to say that a general overhaul of aseptic technique would benefit everyone concerned.

CROSS-INFECTION IN WARDS

Hospital infections, once a terrifying scourge, are not now as common or dangerous as until nearly the end of last century, but if we have flattered ourselves that they no longer happen studies made during the past few years should have disabused us. Everyone knows that a second disease may occasionally be acquired in a fever hospital, but what we have learned lately concerns the wards of general hospitals and varied types of infection the spread of which can only be traced by detailed bacteriological study. The work of Okell and Elliott on cross-infection by haemolytic streptococci in ear, nose, and throat wards first established this method of study; another example of its application is to be found in the recent paper by A. A. Miles[1] and others on the hospital infection of war wounds. A systematic study by this method in the hospital of its origin is also described by Joyce Wright[2]: this was carried out in the children's wards at University College Hospital, covered a period of one year, and was designed to trace the migrations of haemolytic streptococci. All patients had throat swabs taken on admission and at intervals of a week thereafter; nurses' throats were also swabbed weekly, as were any septic or other lesions as they arose which were likely to be streptococcal. The Griffith type of all streptococci was determined, a proceeding to which this sort of detective work owes almost the whole of its value; but for the almost certain proof of identity between strains which can thus be secured the interpretation of such studies would be mere guesswork. Of a total of 551 cases thirty-six had haemolytic streptococci in their throats on admission; seventy-two (13.1%) acquired a haemolytic streptococcal infection of some kind during their stay in hospital. Most of these individual cases formed items in well-defined outbreaks, some having the dimensions of an epidemic, each due to a single type of streptococcus. Each of these outbreaks comprised a variety of clinical conditions—sore throats, otitis media, wound infections—as well as latent cases in which the organism existed in the throat without producing evident effects. That they were recognized as outbreaks having a single cause was due to their analysis in the laboratory; otherwise the overt cases would doubtless have been accepted as misfortunes in the general run of common experience, while the latent infections would of course have been unrecognized. The exact method of spread was not determined; cubicle isolation prevented it, but whether any measure short of this will be effective remains to be decided. A somewhat similar study has been made by H. D. Wright, H. R. Shone, and J. R. Tucker[3] in diphtheria wards. Here proof of cross-infection depends on the existence of *gravis, intermedius,* and *mitis* types of *C. diphtheriae* and the demonstration that a change of type has occurred in the individual throat; this method, of course, cannot reveal all cases of cross-infection, since the newly acquired infection may be of the same type as that existing before. Nevertheless in over 10% of cases in ordinary diphtheria wards reinfection was proved by this means; where bed isolation was practised it occurred in about 5%, while in cubicle wards it rarely occurred at all. Here again the mode of spread is uncertain; contact between patients and carriers among the staff are possible factors, but the most suspicious finding was the presence of fully virulent diphtheria bacilli, often in large numbers, in floor dust, coupled with the fact that old-fashioned methods of sweeping were employed. It is becoming abundantly clear that the oil treatment of floors recommended by Van den Ende and others,[4] possibly extended as they suggest to blankets, is the first necessity in preventing hospital infections caused by diphtheria bacilli and haemolytic streptococci. Only when this wide-open avenue of spread has been closed, as far as feasible precautions can close it, shall we be able to decide what other channels of infection remain to be stopped.

[1] *British Medical Journal*, 1940, **2**, 855, 895.
[2] *J. Hyg.*, Camb., 1940, **40**, 647.
[3] *J. Path. Bact.*, 1941, **52**, 111.
[4] *Lancet*, 1940, **2**, 133.

BISMUTH IN SYPHILIS

Since the introduction of bismuth as a therapeutic agent in the treatment of syphilis there has been much speculation and discussion concerning its mode of action and the dosage and toxicity of the numerous preparations employed. Kolmer and his associates[5 6] concluded from some experiments in rabbits that toxicity did not necessarily run *pari passu* with the amount of bismuth metal injected; that toxicity and therapeutic effectiveness vary according to solubility, not only in the tissues but in the vehicle, and to rate of absorption and excretion; and that both factors are influenced by chemical constitution. Further, as estimations of bismuth in the blood are not a practicable way of determining maximum therapeutic effectiveness consistent with minimum toxicity, recourse was had to urine estimations. It was found that in the case of infected rabbits the urinary level of bismuth required for biological cure was dependent on both the dose and the length of time it was maintained; a certain minimum level is required even though there is prolonged excretion. Human beings require relatively more metal per kilogramme of body weight than rabbits, and it has been calculated that for optimum therapeutic results the amount of bismuth should be 35 to 45 mg. per dose, which would give a urinary excretion of 2 to 4 mg. The amount of any particular preparation injected and the frequency with which it is given will depend on whether the preparation is water-soluble, oil-soluble, or insoluble, and since absorption of the drug varies not only according to the compound but also in relation to the individual himself occasional determinations of urinary bismuth are recommended. Experiments carried out on spirochaetes prove that bismuth is spirochaeticidal both *in vivo* and *in vitro*. Whether this is due to the element itself dissociated from its compounds or whether it effects a union with

[5] *Amer. J. Syph. Gon.*, 1940, **24**, 415.
[6] Ibid., 439.

the tissues is not established. The latter appears to be more likely, but the metal may act in part by the stimulation of antibody production which results from the release of antigenic substances from killed spirochaetes. As a result of their experiments the authors give a list of recommended doses of eleven different bismuth preparations commonly used in America; water-soluble preparations should be given twice weekly, others once every seven to ten days. Bismuth has also a prophylactic action in syphilis, as shown by the experiments of Kolle,[7] who failed to infect rabbits so long as there was any of the metal in the ear, and by Sonnenberg,[8] who was able to protect prostitutes from acquiring the disease by regular intramuscular injections of the subnitrate. These methods, however, are not a practical proposition for mass prophylaxis of human beings. Hanzlik and his co-workers[9] found that when sobisminol, a preparation which has a curative action when taken by the mouth, was given to rabbits it protected them against experimental infection. In view of the fact that the drug, although comparatively non-toxic, has a curative action in human syphilis, it is suggested that it could be used for human prophylaxis with much hope of success. Although this appears to be theoretically probable, it has not yet been tried out, and the average man will hardly dose himself for a week before exposing himself to possible infection, and after exposure the drug is not likely to prove successful, since the spirochaetes will have established themselves before the bismuth has reached an adequate concentration in the tissues.

PERITONEAL IRRITATION AND INTESTINAL ACTIVITY

The surgeon is constantly confronted by the problem of the management of abdominal distension resulting from peritonitis. The causation of this distension has immediate bearings upon the question of treatment. In the absence of gross obstruction associated with colic, a "mechanical" view must favour operative treatment. On the other hand, if the distension is regarded as neurogenic and due to reflex inhibition resulting from peritoneal irritation, then the treatment must be on conservative lines. From the point of view of management the important case is the one in which there is abdominal distension in the absence of all intestinal activity. In the current number of the *Journal*, Douglas and Mann report a series of interesting experiments which shed a good deal of light on the pathological physiology of the condition. These workers produced exteriorized portions of intestine in rabbits and dogs after the method introduced by Biebl. The exteriorized loop remains in continuity with the bowel, has an intact nerve and blood supply, and is enclosed in a bipedicled skin tube completely shut off from the general peritoneal cavity. Subsequently various irritants were injected into the general peritoneal cavity and observations recorded on the activity of the exteriorized gut segment. For the purpose of these experiments inhibition was considered to mean absolute quiescence of the intestine. In the control series of cases it was shown that the injection of Ringer-Locke solution into the general peritoneal cavity produced an effect on intestinal motility. When standardized irritants were injected these constantly led to prolonged arrest of intestinal movements in the exteriorized segment. This arrest occurred in normal animals after section of both vagus nerves, after section of one splanchnic nerve, and after bilateral adrenalectomy. On the other hand, this inhibition did not occur, or was only temporary, after degenerative section of both splanchnic nerves. On the basis of these experiments the authors conclude that intestinal inactivity is of the nature of reflex inhibition, since by reason of the extraperitoneal situation of the loop of bowel the stimulus is delivered to afferents other than those in the loop. The authors hesitate to apply their experimental results too directly to clinical work, but suggest that their evidence supports the neurogenic explanation of abdominal distension associated with a localized peritonitis. Under these conditions operative treatment by means of enterostomy, etc., is contraindicated, and measures designed to overcome the splanchnic inhibition are indicated—namely, splanchnic block, acetylcholine, or prostigmin.

[7] Harvey Lectures, 1924–5, Series 20, p. 188, Baltimore.
[8] *Bull. Acad. Méd.*, Paris, 1933, **114**, 374.
[9] *Amer. J. Syph. Gon.*, 1940, **24**, 468.

WARTIME RESEARCHES ON MILK

In war the dairy cow takes rank as "Farm Animal No. 1." Milk, a home-produced food obtained from animals deriving more than 80% of their food requirements from home-grown feeding stuffs, is a means of supplementing and balancing a diet which might easily become in wartime poor in everything except carbohydrates and calories. The shadow of war is cast upon the annual reports of two dairy research institutes lately received, though one of them, that of the National Institute for Research in Dairying, Reading, is for the year ending September, 1939, and the other, that of the Hannah Dairy Research Institute, Ayr, is for the year ending March, 1940. In both institutes the maintenance of as high an output of milk as possible in emergency conditions has become the keynote of the work, and long-range investigations have receded into the background in favour of the quicker but less satisfactory methods of empirical investigation and piecemeal solution. Among other matters with which the National Institute has concerned itself is wartime cheesemaking. Rennet, which is used to make milk coagulate, is an animal product, an extract of a calf's stomach, but a satisfactory method for extraction of a milk-coagulating enzyme from a vegetable source has been found, and cheese for which vegetable rennet was used has recently been produced. Much further work has been done at Reading on the estimation of vitamins in milk. Biological methods had already shown that commercial pasteurization brought about a definite though small loss in the vitamin B complex, and that commercial sterilization destroyed some 30% of vitamin B_1 but had no apparent adverse effect on vitamin B_2. These findings have now been extended by the application of chemical tests, according to which pasteurization destroys 10% of vitamin B_1 but is without effect on riboflavin, while the loss of B_1 in sterilized milk has been found to amount to 50%, riboflavin again being unaffected. In view of the errors of biological assay, the measure of agreement between the findings obtained by the two methods is regarded as satisfactory. Another piece of research concerns the effect of light on the vitamin C of milk in containers. Visible light is known to have a destructive effect on this vitamin, and experiments have been carried out with bottles of different colours. Brown glass bottles have been found to be most effective from the point of view of preserving the vitamin; green glass bottles come next, and then wax-impregnated cartons. In the cartons twice as much of the vitamin survives as in clear glass bottles. Work has also been done at Reading on the physiology of bovine lactation. Repeated injections of ox anterior pituitary extracts rich respectively in prolactin (pigeon crop-gland stimulating factor) and thyrotrophic hormone into cows in declining lactation have resulted in a marked increase in milk yield, and, with the prolactin

preparation, in a substantial increase in fat content, the average daily milk-fat production being raised by nearly 50%. The milk yield does not continue to increase throughout the period of prolactin treatment, but reaches a steady level and then declines. It is considered that the increase in milk yield and milk-fat content following injections of pituitary extracts cannot be ascribed to the action of a single hormone; probably the secretion of milk-fat is a mechanism distinct from those governing the secretion of other milk constituents. The Hannah Institute has also been occupied with lactation studies, especially the problem of inheritance of persistency of milk yield, or the extent to which ability to maintain a level yield is transmitted by the parent. The experimental results demonstrate the important part played by environment in determining the shape of the lactation curve. It seems likely that a uniform method of bacteriological examination of milk may be adopted for Great Britain. Hitherto in England and Wales the methylene-blue reduction test has been used, and in Scotland the plate count. One reason why the former method has not been adopted in Scotland is that it is said to be less reliable when applied to milk produced and handled in a colder climate. The convenience of the methylene-blue reduction test and its simplicity and cheapness in comparison with the plate count have seemed to justify a more detailed examination of the effect of temperature on its reliability, and so far as the work has gone the temperature factor does not appear to be an insuperable obstacle to the adoption of the reduction method under Scottish climatic conditions.

U.S. HEALTH UNIT AND LIAISON OFFICER

With the consent of the President of Harvard University, Dr. J. E. Gordon, who holds the Charles Wilder Chair of Preventive Medicine and Epidemiology at Harvard, has accepted Mr. Malcolm MacDonald's invitation to act as United States Liaison Officer with the Ministry of Health. Shortly after the outbreak of war Harvard University appointed a committee to consider how the university could contribute material or professional help to a cause closely concerned with its interests. The possible nature of this help was conceived in the broadest terms, with the suggestion that it might be in economics, medicine, sociology, public health, law, and perhaps other fields. Through an exchange of opinion between authorities of Harvard and colleagues in Great Britain it later became evident that help in the fields of public health and medicine was most clearly in point. As a consequence Harvard University made a formal offer to the Minister of Health, which Mr. MacDonald gratefully accepted, to equip and maintain in Great Britain a public health unit for the study and control of communicable disease. The purposes of the unit were defined as: (1) to lend material aid to a friendly nation; (2) to investigate communicable disease under unusual military and civil conditions; (3) to obtain medical information of value to the national defence of America. The unit as originally conceived was to include a group of workers concerned with field studies in epidemiology and a laboratory for the study of associated problems. British authorities early pointed out the desirability of adding to this basic unit a well-equipped hospital for the clinical care and study of communicable disease. This addition became possible through the active co-operation of the American Red Cross, who agreed to build and transport to Great Britain a hospital of 125 beds. The final plans for the unit evolved from discussions between Prof. Gordon and the authorities of the Ministry of Health in London during August and September. Facilities and staff are provided for the study of communicable disease in the field, in the laboratory, and at the bedside. Prof. Gordon returned to America in the latter part of September to assemble staff, order equipment, and lay plans for the hospital. He left in London Dr. John R. Mote, assistant in epidemiology in the Department of Preventive Medicine, Harvard University, now acting as medical adviser to the American Red Cross Committee in London, to continue and complete local arrangements. Prof. Gordon has now returned here, and the first shipments of buildings and equipment are expected to arrive shortly. The headquarters of the unit will be in south-west England, with provision for a mobile team to serve more widely as need may arise. As U.S. Liaison Officer with the Ministry of Health, Prof. Gordon has an office in the Ministry, and is taken freely into the confidence of the Minister and the staff of the Department.

THE KING'S ENGLISH

The latest protest against defilements of "our maternall Englysshe tongue" comes, not from Mr. A. P. Herbert, but from another member of the House of Commons, Mr. Henry Strauss, who in a recent letter to the *Times* denounces as a neologism the word "hospitalize," importing to send a person to a hospital, or to admit or to maintain someone there. Most of us will thank Mr. Strauss for his protest against a horrible word of very ambiguous meaning; but even so it may perhaps not lack defenders, for it raises the old issue between the precisians, whom their critics call pedantic, and the colloquialists, whom the "highbrows" dub illiterate. Language, say the latter, must grow; must adopt new words for new conceptions; must throw off the shackles of obsolete convention under pain of becoming not a living but a dead tongue. They note that sometimes the slang of one generation becomes accepted usage, even of the scholar, in the next or the next but one; and if their sentences lack a verb here or grammatical structure there, comfort themselves with the reflection that anyhow people know what they mean, which is not invariably true. So many of us fall into slipshod speech ourselves that these excuses often gain acceptance among those who dislike to label themselves self-righteous. For all that, slipshod speech and writing are merely signs of slipshod thought and downright muddle. The danger is especially to be avoided in scientific writings, where the exact meaning of every word and phrase should be crystal clear and incapable of misconstruction; if medicine is to remain a science it must conform to this standard. English is not an easy language, but every shade of meaning can be accurately expressed in it if sufficient trouble is taken. Many of us, for instance, are too prone to "give a case morphine," when it is the patient, not the case, who receives the drug; or to say the patient "has no temperature," meaning no rise of temperature; or to "operate a tracheotomy" (an Americanism which shows signs of acclimatization here) instead of to perform it. "Reconsider" is another word which gives rise to trouble: its proper meaning is to consider anew; but some people now use it as equivalent to altering a previous resolution, from which the awkward dilemma arises (if this latter usage stands) that one can reconsider a decision without reconsidering it. And if any reader should detect a deplorable solecism in the columns of the *Journal*, all the Editor can say in mitigation is that he will reconsider the matter.

The Right Hon. Malcolm MacDonald, M.P., has been chosen to fill the post of High Commissioner in Canada for His Majesty's Government in the United Kingdom, and is succeeded as Minister of Health by Mr. Ernest Brown, lately Secretary of State for Scotland.

MEDICAL ASPECTS OF A.R.P.

A conference summoned by the Association of Architects, Surveyors, and Technical Assistants and the National A.R.P. Co-ordinating Committee (the body of which Prof. J. B. S. Haldane is chairman) was held at Islington on February 2. It was attended chiefly by members of London local authorities and their medical officers of health and borough engineers, and the full day's discussion ranged generally over the safety and health aspects of the shelter problem.

An introductory statement was made by Mr. P. P. ROSENFELD, a prominent member of both the convening bodies, who declared the surface shelters to be never more than half occupied, basement shelters commanding greater public confidence. He put the case for what is popularly known as the Haldane shelter (though Prof. Haldane makes no claim to be its designer), which is planned in two stages, the first stage giving as high a standard of health and amenity as is immediately practicable, and the second affording opportunity for strengthening and extending to any degree desired as materials and labour become available. Present conditions in shelters—namely, overcrowding and bad ventilation, often combined with damp and cold—were favourable for the incubation and spread of disease. All previous standards of overcrowding control had gone by the board. In the large shelters also, insufficient and insanitary closets and contamination of food and water might lead to outbreaks of typhoid and dysentery, and typhus might arise from the dirty conditions which bred lice. The Chief Medical Officer of the Ministry of Health had stated that, apart from a certain increase in the incidence of enteric fever and cerebrospinal fever, there were no signs as yet of epidemics. But this, in Mr. Rosenfeld's view, gave little cause for satisfaction, because epidemics arose as a result of lowered standards of resistance coupled with such conditions as existed in many shelters, and once the ground was favourable epidemics might spread like a flame. He also criticized the insufficient height and faulty design of the bunks, the absence of ventilation plants in many shelters, and the instruction to local authorities to put in coal-burning stoves when electrical heaters would be preferable on all grounds.

Those responsible for calling that conference, he said, took the view that it was possible to provide shelters which were far safer than the present types and would furnish healthy conditions and reasonable comfort. The requirements to be fulfilled in a better shelter policy were: (1) a higher standard of protection against high explosives; (2) protection against gas attacks over long periods; (3) healthy conditions for sleeping, including some privacy, and proper spacing of bunks; (4) arrangements for seating; (5) proper sanitary arrangements, including washing facilities; (6) feeding arrangements, providing a limited number of hot meals for those who left straight for work, as well as hot drinks and snacks; (7) medical facilities and isolation arrangements; (8) ease of administration of shelters by marshals and local authorities.

Health Conditions in Shelters

Dr. JOAN MCMICHAEL, in introducing the medical aspects, said that the most important factor in the spread of epidemics was overcrowding, which in some shelters was present to an extreme degree. The possible sources of illness were many, including air-borne or droplet infections, infections due to direct contact, infections arising from defective sanitation aggravated by overcrowding, infections carried by animal pests (including mosquitos which bred in stagnant pools of water in some warm underground shelters), deficiency diseases, especially among Tube shelterers condemned for long periods to remoteness from air and sun, and finally the many hours in cramped positions might bring about an increase in the number of sudden deaths from pulmonary embolism. The Horder Report said that people should be encouraged to use the Anderson shelters, but it must be remembered that there was often severe overcrowding in these shelters, with far less warmth, comfort, and safety than in the public shelters. A good shelter programme should combine the maximum degree of safety with the minimum risk of disease. The two-stage shelter advocated by the A.R.P. Co-ordinating Committee was the best, because it left room for a certain amount of dispersal through the sections and was also to be approved from the medical point of view.

In the general discussion widespread dissatisfaction was expressed with the Government's shelter policy, and, particularly, with the failure to consult borough engineers and surveyors on problems relating to their own areas. Lack of co-operation between the Government and local authorities was evidently a sore point. Several representatives declared that they ought to be given more responsibility in their own localities and be less subject to the vagaries of Whitehall.

One speaker, a woman councillor, complained that doctors and nurses were being drafted into shelters rather with the idea of waiting for epidemics to turn up. Of course, in a large shelter many ailments besides epidemic illness call for attention. This speaker also mentioned the question of shelter sanitation and the "scandal of the bucket" on the Tube platform to be found at many stations. Water closets were still allowed only in certain cases. The compressors being fitted in Tubes to pump up the sewage would still necessitate the use of chemical closets, although they could have been arranged so as to be capable of taking water closets at a future date. An architect said that the installation of water closets would have been perfectly feasible; the initial cost would not have been much greater than that of the mechanical ejector system, and the cost of upkeep much smaller.

The conference also discussed the care of the bombed-out, and a plea was made for the appointment of officers in every borough whose task it would be to see that these people were dealt with rapidly and effectively, also for the keeping of registers of empty houses in which homeless persons could be placed immediately. A resolution was carried unanimously expressing disquiet at the effects of the Government policy in the London area, and urging much higher standards of safety, health, and welfare in the shelters, in particular the adoption of a design of shelter which would allow subsequent strengthening so as to render them proof at least against direct hits by bombs of medium calibre. The resolution also stressed the need for representation of local authorities in the offices of the Regional Commissioners.

AWARDS FOR GALLANTRY IN CIVIL DEFENCE

The award of the George Medal to Dr. Malcolm Manson, *M.C.*, Medical Officer of Health, Wood Green, is announced in a *Supplement* to the *London Gazette* dated February 7, and in the same issue the names of Dr. John Spittal Cameron, assistant medical officer, Emergency Medical Service, Fulham, and Dr. David Cochran Hanson, *M.C.*, medical officer of mobile unit, Emergency Medical Service, Fulham, are included in a list of those who have received commendations for brave conduct in civil defence.

Dr. MALCOLM MANSON: "A heavy H.E. bomb fell, causing a tunnel to collapse. A number of people were trapped under the debris and the clay which had fallen through the cavity. Dr. Manson arrived on the scene within a few minutes of the occurrence, and immediately assumed the direction and leadership of the rescue work. For nearly three hours he worked without intermission actively participating in the release of persons trapped in the debris heap, giving medical aid where it was needed and all the time keeping effective control. Throughout this period he was in grave personal danger from frequent falls of clay. It seemed likely that a further portion of the tunnel would collapse. At one period he was lying full length on the heap endeavouring to release a man partially buried when there was a shout from the look-out man of 'Run for it.' The doctor ignored the warning and continued his efforts for the trapped man. There was a large fall of clay and the doctor was struck by a large piece full in the back. He was partially buried and had to be dragged out feet foremost. He rested for a few minutes, and then, in spite of severe pain, carried on with the work. Dr. Manson's pertinacity, courage, and disregard of personal safety set a wonderful example to the men and was no doubt responsible for the saving of a number of lives which otherwise would have been lost. He sustained serious injuries during the rescue operations."

Correspondence

Nuffield Provincial Hospitals Trust

SIR,—Your admirable leading article on the Nuffield Provincial Hospitals Trust (January 25, p. 125) was welcome to those of us who are engaged in solving the problems of hospital regionalization. There are, however, some statements therein which might give rise to misunderstanding and perhaps to apprehension.

Referring to the Medical Advisory Council as representative of "several specialisms in medical science," you hardly do justice to its composition. Although the council is not yet complete it does contain representatives of general practice, both urban and rural, general and specialized consulting practice, public health and preventive medicine, pathology, teaching and research. Moreover, its members are drawn from widely separated areas in England, Scotland, and Wales, and include several who have worked or are working with local authorities. Great distances have not deterred them from attendance at meetings in Oxford even in these days of slow and tiresome travel.

You suggest, too, that the main obstacle to our activities is "the reluctance of some local authorities to co-operate." My experience does not lead me to take that view. There *is* reluctance to be met with here and there on the part of local authorities *and* of voluntary hospitals, which is only to be expected before any new scheme or principle is accepted, but, generally speaking, local authorities have been most responsive and co-operative. Perhaps this may be due in part to the fact that the provisional Central Committee does already contain at least six members who are actively engaged in city and county council administration, a representation of local authorities which is likely to be increased in the near future.—I am, etc.,

Christ Church, Oxford, Feb. 3. E. FARQUHAR BUZZARD.

Insulin Supplies and Wartime Economy in Prescribing

SIR,—In recent months anxious letters from diabetics all over the country, but mostly from small towns and villages, have shown their difficulties in obtaining their accustomed supplies of insulin. Bombs have certainly destroyed some insulin supplies, but not enough to make any real difference to the abundant stocks in this country—of this diabetics and their doctors may rest assured—though local distribution has been temporarily upset. The manufacturers have noted that, besides the annual gradual increase in the sale of insulin, national emergencies like September, 1939, the fall of France, the beginning of the air "blitz," push up the insulin sales by 20% to 40% for a few weeks. As a result local supplies are almost depleted; diabetics cannot obtain all they want of their usual make or strength of insulin: they panic a little and press the local chemist, who makes unexpected demands on the manufacturer, and so on. So the local supply of insulin can be temporarily upset by greatly increased demands, especially when delayed distribution is sometimes inevitable. A recent article in the *Pharmaceutical Journal* (December 7, 1940) urged chemists to lay in larger stocks of insulin, and this, though all to the good of diabetics in some ways, had the unfortunate result of putting some manufacturers under difficulties and accentuated the local shortage in some areas. Doctors, chemists, and diabetics could help the manufacturers greatly in the adequate distribution of insulin by making no sudden increased calls for it, but quietly laying in adequate stocks by careful provision.

Also, by prescribing and using the more concentrated strengths of insulin all concerned could help greatly and contribute to national economy. One of the main difficulties for manufacturers now is the supply of suitable glass, and in this an obvious economy is possible. There are three strengths of insulin on the market—20, 40, and 80 units per c.cm. (this is unfortunately not generally realized)—and it is obvious that by prescribing the stronger solutions large numbers of bottles and packings could be saved. At present the weakest strength is still most widely used, and if 40 units per c.cm. insulin were prescribed instead of 20 units per c.cm., 20,000 bottles a week would be saved.

Apart from economy, there are other good reasons for using the stronger insulins. Most patients prefer them when they know about them, because they reduce the volume of the injection without making the accurate measurement, even with small doses, difficult. Again, at present numerous mistakes are made between the three strengths of insulin, which would ultimately be reduced by the use of only two varieties—40 and 80 units per c.cm. This would also bring soluble insulin into line with protamine insulin, of which no 20 units per c.cm. strength is manufactured. Personally I have not prescribed the weakest solution—20 units per c.cm.—for four years, think it unnecessary, and that its disappearance from the market would be a blessing to diabetics and manufacturers. Then we could have a standard insulin solution—U40 per c.cm.—for most general use and a stronger solution—U80 per c.cm.—for patients on very large doses. To effect such a change I suppose the *British Pharmacopoeia* and other necessarily slow-moving bodies must be concerned. In the meantime, therefore, I would urge the immediate prescription of the stronger insulins, with corresponding reduction of the amount drawn into the syringe.

Doctors should also reassure diabetics, who are often ridiculously conservative in their use of one particular make and strength of insulin, that all brands and strengths in this country are equally good and active, and can replace, if necessary, their favourite bottles, if the correct adjustment is made in the syringe when the strength—20, 40, or 80 units—is changed.

I would also make a plea for change in the clumsy nomenclature we use and the confusing differences in labelling used by our three manufacturers of insulin. In this letter I have had to waste your valuable space in talking about insulin 40 or 80 units per c.cm.—which means little to many patients and is a tongue-tying description. The Americans aptly call and label these insulins U40 and U80 (clear and short terms), and if this practice was adopted here in bold letters on the bottles much dangerous confusion between doctors, nurses, and patients about different strengths would be minimized.—I am, etc.,

London, W.1, Feb. 7. R. D. LAWRENCE.

Civilians Blinded in the War

SIR,—Attacks from the air have already resulted in a number of cases of blindness among civilians, and doctors responsible for the care of such cases are faced with a specially difficult task when the time comes for them to acquaint their patient with the fact that sight has been lost. However tactfully and wisely that information is imparted it is bound to be a shock, and I may be permitted, perhaps, to emphasize that the patient, when he learns the truth, should be at once assured that proper training will enable him to overcome the handicap he has now incurred, and that training and help of the most practical kind are available to him.

I take leave in this connexion to call the attention of doctors to the comprehensiveness of the system of blind welfare now established in this country. It provides for the education, social care, training, and employment of blind people of both sexes and of all ages. The county council or the county borough council of the area in which the patient's home is situated is responsible, under the Blind Persons Acts, for ensuring that every blind person is provided for according to his or her needs. Any hospital, therefore, which has a blind patient should notify the responsible local authority. If there is any doubt of the right person to address in the matter, we, at the National Institute for the Blind, will gladly act as intermediary and give any possible help.

May I add, Sir, that the rehabilitation and re-education of civilians who are blinded in the war is a matter of the keenest interest to us and other voluntary organizations which work in co-operation with the responsible local authorities in all parts of the country, and that no effort will be spared to meet their needs, however great they may be.—I am, etc.,

W. MCG. EAGAR,
London, W.1, Jan. 31. Secretary-General.

The Transfusion Problem

SIR,—We were interested in the last paragraph of Dr. DeGowin's letter on the transfusion problem (February 1, p. 169), concerning the temperature at which stored blood should be given.

We are in entire agreement with his statement that it is unnecessary to warm stored blood, beyond, perhaps, allowing it to come to room temperature by removing it from the refrigerator about thirty minutes before use. This is only done if time allows. As long as the drip method of transfusion is used we can see no possible danger at all, and, in fact, it is our personal experience since we ceased warming blood as a routine before transfusion that reactions have been far fewer. The probable explanation of this observation is that the rather haphazard method previously employed—namely, immersing the blood container in a receptacle with warm water at about 105° C., to which further hot water was added from time to time—caused overheating of the red blood cells in immediate contact with the glass container, resulting in the destruction of these cells.

In a short paper entitled "The Use of Placental Blood for Transfusion" published in January, 1939 (*Lancet*, **1**, 200), in collaboration with K. G. Seager, we stated: "We are now of the opinion that it is unnecessary to heat the blood before use."—We are, etc.,

A. P. M. PAGE.
Leicester, Feb. 4. E. M. WARD.

Optimum Calcium Requirement

SIR,—Dr. I. Harris and Messrs. J. T. Ireland and G. V. James, in summing up the conclusions of their article on optimum calcium requirement (January 11, p. 49), make very definite statements which, if correct, are of great interest to those concerned with dietetics and their social implications.

They state that there is no particular evidence to suggest that the great majority of our population suffer from the effects of calcium insufficiency; that the calcium intake of the present dietary regime is ample; that large sections of the population eat too much calcium-rich food; that there may be some indication for reducing food calcium but none for increasing it; and that half the population will suffer from the effects of hypercalcaemia if the calcium content of our diets is increased.

As these conclusions are so far-reaching it is worth while to examine critically the evidence on which they are based. To do this, however, one needs many more details than are given in this article. One would like to know, for instance, the method used to estimate the serum calcium; what type of diet was given to the patients in the experiments and how its calcium content was determined; whether the high calcium diets mentioned were arrived at by the addition of calcium salt, and if so what salt? Do the authors consider that the short period of fourteen days during which the experiments were conducted is sufficient to justify such sweeping conclusions as to calcium balance? Have they taken into account the fact that calcium intake must inevitably be greater than calcium absorption, which accounts for the increase in faecal calcium which they observed in their high-calcium-diet results? Regarding the patients' diets at home, it would be useful to know what tables of values were used in estimating the calcium content and the weekly wages of the patients in question.

The animal results as published are particularly inadequate. They do not tell us how many animals were kept on a calcium-rich diet, for how long, nor the nature of the diet or the method of estimating its calcium. Moreover, are we justified in drawing any conclusions as to human calcium needs from an animal with such very different dietetic habits as the rabbit?

We are told that calcium is second only to protein as an important factor in kidney strain, but we are given no inkling of the actual proportion of kidney work which comes under the heading of calcium secretion. The figures quoted give the misleading impression that the total kidney work in high and low calcium diets is 18.8/5.1 respectively, or 14.0/0.9 in the second case mentioned. Finally, one may ask if it is justifiable with such a common condition as arteriosclerosis to draw any conclusion from the Registrar-General's returns, since in many cases in which it occurs arteriosclerosis will not be mentioned on the death certificate.

Until more detailed and satisfactory results are available I see no reason to disagree with Sir John Orr's dictum that half our diets are deficient in calcium. As our knowledge of the subject grows it may be that we shall find more abundant clinical evidence of calcium deficiency. Studies of the type carried out by Miss Irene Allen (January 11, p. 44) may be a step in this direction. The mere fact that our existing views on diet are based on inadequate data is no excuse for attempting to disprove them with data which are equally, or even more, inadequate.—I am, etc.,

Northwood, Middlesex, Feb. 1. B. H. KIRMAN.

Differences in Infectivity at Home and Abroad

SIR,—I have recently returned from escorting 300 evacuee children to the United States. Shortly after we arrived there one of the children, a boy aged 5, developed a severe attack of chicken-pox, which I and the American doctors who saw him decided was most probably developed from an infection received in the United States. Reference to his medical documents which I had taken with me showed that he suffered from chicken-pox in England exactly a year before he went to the United States. Unfortunately the doctor who attended him then is now a prisoner of war, but I have obtained information from his locumtenent, who looked up the details of the attendances at that time, and discovered that the diagnosis was chicken-pox. The extraordinary thing about the attack in the United States was its extreme virulence, and it seems a justifiable conclusion to me that there is some difference between the infecting agent in the English variety of chicken-pox and the American variety. I wonder if this is an actual observed fact and if anybody can corroborate it. One would have thought that an attack of chicken-pox only a year previously would have guaranteed a fair degree of immunity to infection so shortly afterwards, and this is rather borne out by the fact that other children on the way over developed a mild form of chicken-pox, the infection from which was received in England. As it was more than three weeks after we landed in the States that the child developed this other attack it would seem that the infection was undoubtedly of the American variety.

All this prompts me to ask whether there may be similar differences in the infectivity of other diseases in the States as compared with the same diseases in England. I have observed in the Press that quantities of serum for immunization against diphtheria are being flown from the States for use in this country, and I should be interested to know whether it is possible that this serum may not immunize against our British brand of Klebs-Loeffler bacillus.—I am, etc.,

Wealdstone, Feb. 5. J. B. WRATHALL ROWE.

Prepared Bran in the Prevention of Constipation

SIR,—I hear that "All-Bran" has been classed with "luxury breakfast foods" and will cease to be obtainable when the present stock has been sold out. I have no financial interest in the manufacture of this preparation, but I am convinced that the impossibility of obtaining it would be harmful to the numerous persons who depend on it for the prevention of constipation. Many of them would feel themselves compelled again to resort to purgatives of various kinds, from which they have successfully freed themselves by the help of bran.

The truth is, of course, that All-Bran consists almost entirely of cellulose, which, as is well known, cannot be absorbed from the human alimentary canal and therefore cannot be termed a food in the ordinary sense. As it cannot be absorbed, it inevitably increases the bulk of the contents of the large bowel and thus favours defaecation. Everyone depends more or less on cellulose for the normal action of his bowels, but, just as some children require more vitamin D than others in order to escape rickets, so some individuals require a greater cellulose intake than others to avoid habitual constipation. I need not enter here into the reasons why some children require the intake of more vitamin D than others, or why some persons need more cellulose than others

in order to avoid constipation. Factors in early upbringing and general hygiene may have much to do with it, and especially the prevalent habitual use of purgatives of all kinds, though the constant use of purgatives has at last become less universal, thanks to popular teaching on the subject.

It is hardly an exaggeration to say that of the adult patients I formerly used to see in hospital as well as in private practice a large proportion thought that they could not possibly get on without the habitual use of purgatives. Many of the others avoided constipation by bulky diets, which, though they provided sufficient cellulose to avoid constipation, tended to induce obesity and other evil results of over-feeding—often aided in that respect by insufficient open-air exercise. In fact, the large meals which they took contained enough cellulose but too much nutritive material of various kinds, and thus, though their intake saved them from habitual constipation, the results of habitual over-nutrition tended to shorten their lives, making them die from degenerative diseases before their time—say, between 55 and 65 instead of between 65 and 75 or later.

For those persons whose bowels require a relatively large proportion of cellulose in order to act properly it is a hardship to cut off their bran supply. For many of them excess of the stringy cellulose of vegetables causes flatulence and does not act so well as does the granular cellulose material of All-Bran, which swells up to a mucilaginous consistence in the bowels. All-Bran is, as far as I know, the only properly prepared bran at present available in England, and it would be, I think, a great pity if the supply were cut off. How far ordinary bran, as given to animals, could be used for the same purpose, I am not able at present to say.—I am, etc.,

London, W.1, Feb. 5. F. PARKES WEBER.

Research in Stilboestrol

SIR,—In your issue of December 21, 1940, there is on page 876 a definite misstatement with regard to stilboestrol. This substance was produced as the result of a very long series of investigations in our respective departments, and if you refer to the various publications you will find acknowledgments to commercial firms for the assistance we received. Thus in the paper by Dodds and Lawson describing for the first time oestrogenic compounds which do not contain the phenanthrene nucleus (*Proc. roy. Soc.*, B, 1938, **125**, 222) we acknowledged the great help given by Dr. F. Lee Pyman, F.R.S., of Messrs. Boots Pure Drug Co., Ltd., who supplied us with a whole series of phenyl methanes and ethanes. Again, in the paper by Dodds, Golberg, Lawson, and Robinson (*Proc. roy. Soc.*, B, 1939, **127**, 140) acknowledgments are made to Messrs. Boots for assistance in the preparation of diethylstilboestrol and to the British Drug Houses, Ltd., for a communication respecting the properties of diethylstilboestrol.

Whilst it is true that the investigations were begun and carried out in university laboratories, it is definitely not true to say that the drug houses made no contribution whatever to the work.—We are, etc.,

E. C. DODDS.
R. ROBINSON.

The Courtauld Institute of Biochemistry, Middlesex Hospital Medical School, and the Dyson Perrins Laboratory, Oxford, Feb. 5.

*** While accepting the above correction, we would stress that the research on stilboestrol was initiated in university laboratories.—ED., *B.M.J.*

Recruits and Tuberculosis

SIR,—Examination of the chest for tuberculosis in recruits and other applicants for war work is more a dynamic or physiological than a static or anatomical problem. Our object is not so much to discover what lesions are present as to estimate their probable effect upon health under the new conditions of life—and this cannot in doubtful cases be done by physical examination alone, with or without *x* rays, or at one sitting. Moreover, we have to allow for undiscoverable lesions in the lungs and elsewhere.

During the last war as tuberculosis officer, and both earlier and later in sanatorium practice, I found many examples of quiescent or arrested tuberculosis in which without a practical test one could not estimate the chances of health. The story of Aesop and the traveller is apposite here. Some of my patients who had had tuberculous lesions in the lungs served in the Army with credit and without a breakdown; and, of course, thousands who have minimal tuberculous lesions in the body remain in excellent health.

In the Army, apart from injury, the chief differences from ordinary civil life depend upon over-exertion and lack of rest, irregular meals, exposure to trying weather or climate, sometimes on stuffy rooms or dusty or poisonous atmospheres. Local extension of a tuberculous lesion is usually very slow; but we may take any evidence of the leakage of toxins into the general circulation with imperfect compensation as a sign of activity. An exercise test with very careful thermometry will often help in doubtful cases. The usual methods of temperature-taking by nurses or overworked medical practitioners in civil life would, however, be of no use for such a test.—I am, etc.,

Farnham, Surrey, Feb. 1. F. R. WALTERS.

Prosthetic Ulcer of the Mouth

SIR,—I was much interested in Mr. H. T. Simmons's paper on prosthetic ulcer of the mouth (January 25, p. 119). I described this condition in 1939 (*Practitioner*, 1939, **143**, 113) under the designation of "denture ulcer and denture granuloma," the term "granuloma" being necessary, as many of these cases do not present themselves as ulcers. Hospital records do not present a large series, as many are treated in the out-patient department. It is, in my opinion, a relatively common condition, and this is not surprising in view of the neglect with which many persons treat their dentures. In a series of fifty-eight consecutive individuals, all of whom were wearing dentures and who were admitted to hospital for various surgical conditions, I found that fourteen had not had an adjustment or remodelling of their dentures carried out for ten years or more, the average period being twelve and a half years. It is significant that these individuals had not seen a dental surgeon for a similar period. Another interesting feature elicited was that in six instances the wearer was not in the habit of removing the denture for regular cleansing, and one woman had not removed her denture for several years. In this instance the woman states that she had on several occasions attempted to remove her denture, but had failed to do so. Other factors in the causation, in addition to those mentioned by Mr. Simmons, are alteration of the distribution of occlusive pressure and alteration in the action of the temporo-mandibular joint coincidental with the age changes at the angle of the jaw. Removal of the offending denture eliminates all pain, tenderness, and discomfort within a short space of time, but, once developed, the swelling does not appear to shrink, even when the causation factor is removed.

Provided the possibility of a denture granuloma is considered, it is not likely to be confused with a carcinoma of the gum, especially as the granuloma is covered by normal epithelium and is firm or elastic in consistence.

With regard to treatment, I think quicker healing can be obtained by an elliptical excision of the swelling, followed by loose suturing of the adjacent mucosa over the denuded area. This can be done under local anaesthesia, and healing is usually complete within ten days. My experience corresponds with that of Mr. Simmons in that these small lesions are extremely radio-resistant.

Finally, I suggest that the description "dental granuloma," implying cause and effect, is preferable to such terms as false epulis, localized hypertrophy or papilloma of the gum, or even prosthetic ulcer of the mouth, especially as the lesion may present as a granulomatous mass without ulceration.—I am, etc.,

Liverpool, Feb. 1. J. COSBIE ROSS.

SIR,—The condition described by Mr. H. T. Simmons in the *Journal* of January 25 is one well recognized by dentists. The ulceration and hypertrophy of the tissues in the lip or the cheek sulcus which is described is due to pressure of a denture.

Dentures are constructed, especially for edentulous mouths, to obtain the maximum amount of retention, and hence of stability. This entails making the "gum" portion of the

denture (that is, outer and inner rims) reasonably deep; it is a simple matter to reduce the depth, and therefore it is wiser to err in making it too deep rather than not deep enough. Consequently, it is usually necessary sooner or later to reduce the depth, or, to use the dentist's term, "ease" a denture. Patients vary greatly in their sensitiveness to the pressure of dentures: some describe the slightest abrasion of mucous membrane as acute discomfort, while others will tolerate, with little or no inconvenience, a denture which is cutting deeply into the gums. If for some reason or other the necessary easing of a denture is not carried out, the condition described by Mr. Simmons may in time result, and is more likely to do so in those patients with less sensitive gums who are, consequently, less likely to seek relief.

The condition is simply an ulceration due to pressure (that is, trauma), such as would occur in other parts of the body under similar conditions. It does, as Mr. Simmons states, appear to occur more often in the front than the back of the mouth and in the lower rather than in the upper jaw. The groove or grooves in which the denture lodges or dislodges is/are formed by an overgrowth of the gums (that is, mucous membrane) rather than by a destruction of the gums; the condition is similar to that of a tightly fitting ring which may become embedded in the tissues if the finger should swell. The gums eventually become "ploughed" into deep furrows and ridges by constant movement of the denture, especially if its edges are sharp. In a pronounced case this may take months or years to develop. The situation is determined by the site of pressure; the fraenum of the upper and lower lip may account for its more frequent appearance in the middle line. Atrophy of the alveolus, by allowing the denture to sink more deeply into the gums, and also by favouring its mobility, is probably an important factor in initiating this condition.

I have observed this condition in varying degrees on very many occasions—probably a hundred or even more—and have rarely seen, as far as I can recollect, malignancy as a result, although naturally the condition does not confer immunity. Ulceration, even in the deeper portions of the furrows, is not necessarily present, but, if present, the lymphatic glands in the neighbourhood may be enlarged, as with any other form of surface infection. Age, sex, and site play no very important part provided the above conditions are present, but it is undoubtedly more common, as Mr. Simmons remarks, in edentulous mouths, which are usually associated with advance in years.

The treatment I have adopted in those cases requiring operation is: (1) To infiltrate with a local anaesthetic the linear ridges or fringes of mucous membrane. (2) To grasp the free margin of the fringe with one or more pairs of pressure forceps according to its extent. (3) To excise the fringe (nearly at a level with its base or origin) with scissors curved on the flat, the fringe being held taut meanwhile by means of the pressure forceps. (4) To deal with any secondary fringes in a similar way. (5) To bring the edges of the wound together with one or more stitches, if this is necessary. (6) To instruct patients to discard their dentures until the wound has soundly healed (usually two or three months) and then to have either their present denture modified or preferably a new one made to the altered conditions of the mouth. Reducing the edge of the denture alone is insufficient except in slight cases, when the commencing elevations or ridges consist of vascular granulation tissue and not the firm fibrous tissue which is formed later. I described this method of treatment in 1911 (Annual Reports, Royal Dental Hospital, published by John Bale Sons and Danielsson, London).—I am, etc.,

London, W.1, Feb. 3. F. COLEMAN.

Acute Bronchiolitis in Children

SIR,—The morbid anatomy of bronchitis and bronchiolitis and its relation to their clinical manifestations has been the subject of our investigations for a long time. Therefore we would like to make some additional remarks to the excellent article by Drs. D. Hubble and G. R. Osborn (January 25, p. 107). We agree with the authors of the article that bronchiolitis in influenza is a very grave complication indeed. From the point of view of morbid histology influenza-bronchiolitis holds a kind of key position. We have described this type with its peculiar features in a recent paper (*Archives of Disease in Childhood*, December, 1940). We pointed out in this paper that bronchiolitis is a complicated affair, and that a number of types must be differentiated. Two main groups may be distinguished: catarrhal and mural bronchiolitis. The latter again consists of three types which are the result of more or less intense inflammation: simple, proliferative, and destructive mural bronchiolitis. The proliferative type is most frequently met with in influenza, measles, etc. This peculiar form is described in detail in the article mentioned.

Secretion, which plays such an important part in the catarrh and inflammation of the bronchi and bronchioli, is discussed in an article to be published shortly. The distribution of the glands and of other secreting tissue all over the air-conducting tubes is described in this paper, which is based on extensive investigations with a special method. In addition the article gives an exact histological definition of bronchi and bronchioli. This, we believe, will help to separate the clinical picture of bronchiolitis from other conditions affecting the bronchial tree.—We are, etc.,

London, N.W.7, Jan. 31. STEFAN ENGEL, G. H. NEWNS.

Sterilization of Instruments

SIR,—Dr. H. J. Parish (January 25, p. 130) stresses once again the importance of sterilizing instruments by heat for diphtheria and other inoculations. Many doctors think that frequent boiling of needles soon blunts them, and it is not altogether easy to make suitable arrangements for the rapid inoculation of large numbers of children, etc. In view of the enormous number of inoculations required at the present time, details of a simple routine which I think meets the need of sterilizing by heat quite adequately may be of general interest.

One syringe is used for performing the inoculation, and should, for rapid working, be large enough to contain ten to fifteen doses at one filling; a second syringe—preferably of 5 c.cm.—is in the hands of an assistant, who can be instructed in her duties in a few moments. The second syringe is first filled with sterile water, and when the first inoculation has been performed the needle is taken off by the operator and placed on the syringe held upright by the assistant. She then squirts a few minims of water to clear the needle and dips the needle only for 10 seconds into a pan of boiling water. The syringe is then held with the needle upright and a small amount of air drawn through the needle. Emptying the needle in this way minimizes the very real danger that some water remaining in the needle may be injected with the inoculation and materially upset the accuracy of small doses such as 0.1 c.cm. of A.P.T. By this time the operator has inoculated a second child, and he takes off his needle and puts it on the nozzle of the assistant's syringe, from which she has removed the freshly sterilized needle and proceeds to put it on the vacant nozzle of the operator's syringe. In this way only two needles are used, and I find in practice that this arrangement works very well and rapidly. The basis for this method is to be found in the interim report on "Hospital Infection of War Wounds" in the *Journal* of December 28, 1940 (p. 895), where it is stated: "A dip lasting five seconds was lethal in all tests." If this applies to artery forceps, which have quite a definite heat capacity, it must apply even more strongly in the case of a hypodermic needle, which has practically no heat capacity at all. Needless to say, it is only the cannula of the needle which needs to be dipped into the water each time, and if desired sterilized forceps could be used instead of fingers to remove the needles from one syringe to the other, though I doubt if this is necessary with moderate care.

If there is any real danger from trusting to alcohol sterilization it seems right that the authorities should forbid reliance on this method for mass inoculations of all kinds, and the method I have outlined enables one to utilize heat sterilization with a minimum of difficulty, and also a minimum of equipment and assistance. I personally have not been able to detect any blunting of the needle after many such short immersions in boiling water, and I think it is only prolonged boiling which is likely to have any such effect.—I am, etc.,

Winsford, Feb. 1. W. N. LEAK.

Adrenaline in Asthma

SIR,—The correspondence resulting from the letter of Sir Arthur Hurst (September 7, 1940, p. 337) has raised many points of interest. Apart from the reported failure of adrenaline in some cases, the danger of morphine in severe asthma has received timely warning from Dr. M. Park (January 11, p. 65).

In addition Dr. Park raises other points of interest in the very difficult cases of status asthmaticus.

(1) Can the pathological conditions which cause the different types of status asthmaticus be diagnosed clinically from the history or examination? These often can, for the causes of status asthmaticus are often the causes which produce the ordinary attack of asthma in the same individual. Occasionally it is otherwise, as in the case of a male asthmatic, hyperpietic, who was under treatment for asthma in Stobhill Hospital. While improvement was being maintained he acquired an attack of fibrositis. For its relief he was given veganin tablets by a house-physician, and within thirty minutes he commenced having severe asthma. This defied adrenaline for three days, and he looked like dying. Intravenous aminophylline was then suggested, and its success was immediate. It would be interesting to know whether this medicine has good effect on other aspirin-sensitives.

(2) If so, are any of the different methods of treatment applicable particularly to a particular pathological state? and (3) Are there any other indications for the selection of the method of treatment, any contraindications, or is there anything noteworthy in the method of administration? Adrenaline should always be tried first and repeated, but three points in the treatment should always be kept in mind. First, the difficulty in getting rid of tough mucus plugs. As mentioned previously (November 16, p. 684), 30 to 40 grains of sodium iodide in 250 c.cm. glucose-saline solution should be given intravenously if there is no iodide intolerance. Other methods include bronchoscopic suction and emesis. Secondly, dehydration; this must be combated by saline-glucose intravenously, and it may be a life-saving measure. Also, the glucose supplies a source of energy. Thirdly, rest, oxygen inhalations, ether rectally or by inhalation, or barbiturates variously administered may be tried in appropriate doses in suitable cases. The discussion of the treatment of status asthmaticus is one on which considerable time and space may be spent, but its ultimate conquest depends essentially on the alteration of the physical or biochemical constitution of the individual which predisposes to the asthmatic diathesis.—I am, etc.,

Glasgow, Jan. 19. GEORGE KRASNER.

The Fixed First-aid Post

SIR,—For some time past we have been reading in the *Journal* many views on the use and service of mobile units in A.R.P. These can only be gauged by the results and useful work done in each district. Of the fixed first-aid post we have heard nothing, except that some of your correspondents choose to ignore them, and speak of all cases being sent to hospital, just as if no intermediate source of help existed between the mobile unit and the hospital ward. As one in charge of a fixed F.A.P. in a London district which has suffered heavily, I think that excessive numbers of casualties are being whisked off to hospitals without any attempt being made reasonably to segregate them. This is due to the difficulties met with by the hard-worked ambulance services, etc.

In my view, most cases of injury, major or minor, can be dealt with satisfactorily at any fixed F.A.P. and so prevent the terrible rush of cases to already overworked and lessening numbers of hospitals. I know the answer to this suggestion is that the Ministry says "only walking cases to the F.A.P." It is with this attitude that I join issue. Most cases at the post can receive appropriate anti-shock treatment; haemorrhage can be controlled; fractures can be temporarily splinted; and patients allowed to recover in the warmth and bright surroundings of the F.A.P. After a reasonable time the ambulances can be summoned, and if correct treatment has been given the casualties can then be removed to hospital, where they can be put to bed and perhaps left till the following morning. This is much better than having ambulances bumping about through streets unknown to the drivers in the dark and sometimes taking up to half an hour to reach the allotted hospital. This would also give the hospital staff a breathing space wherein to deal with other casualties as they arrive.

It is, in my view, an inhuman act to turn away from the F.A.P. any case capable of receiving adequate temporary treatment there, however serious the injury may be. I do not know what the experience and views of other medical officers of a F.A.P. are, but I fancy none of them would shirk dealing with any form of casualty brought to them.—I am, etc.,

DANIEL HUGHES,
Feb. 5. M.O., Fixed F.A.P., London.

The Mobile Unit in Action

SIR,—It has been interesting to read the recent correspondence appearing in your *Journal* on the subject of mobile units, especially as everyone is not agreed as to the utility of these. The fully equipped and manned mobile unit consists of: (*a*) the personnel (a doctor, with one or more qualified nurses and lay persons trained in first aid); (*b*) the equipment; (*c*) the unit itself. As regards (*a*) it will generally be acceded that such a mobile personnel taken to the incident by car can be of great assistance in dealing with the injured; (*b*) this is at present carried in the unit, but such equipment could be taken to the incident by a light vehicle; (*c*) a mobile surgical unit large enough to accommodate patients during treatment might be of help at the incident, but many of the units now in commission are really not suitable for giving treatment in the unit itself, so that in such cases the only value of the unit is as a conveyance of equipment.

It would be interesting to have the views of medical men who have had actual experience with mobile units in action, especially as to whether the utility of the unit consists mainly in its transport value. Are many mobile units worthy of the label "mobile first-aid posts"?—I am, etc.,

J. F. MACDONALD,
Chelmsford, Feb. 8. Medical Officer of Health.

Certificates for Night-shift Workers

SIR,—It has come to my knowledge during my duties in connexion with industry that it is viewed with considerable concern that certain men and women wish to avoid their due share of night-shift working.

At the present moment the Government is insisting, not only on such night work, but upon a record being kept of the hours each machine is in use; and those who, for no real physical disability, acquire from their doctors certificates recommending that they be excused night work, not only throw vital production out of gear, but in certain instances provoke others to plead the same medical excuse, with increasing interference with output and unrest in the shop concerned.

I would therefore put in an earnest plea for my colleagues in the profession to give such certificates only after satisfying themselves to the hilt that night work is definitely injuring the health of the individual worker.—I am, etc.,

Jan. 31. AN EXAMINING FACTORY SURGEON.

Medicine in a Changing World

SIR,—With reference to your leading article "Medicine in a Changing World" (January 18, p. 91), the first part of Sir John Orr's statement, "The medical profession contains within it experts on every subject that affects human welfare," members of any other profession or organization could lay claim to a similar statement, but public opinion, I think, would be against it in either case.

The second part of Sir John's statement, "It is the only organized group of men competent to make a statement on human needs," would, if true, place the onus of all economic and political affairs on the medical profession. On the economic side it is not pleasant to read in Sir John's statement that "the profession has been too much occupied with its own remuneration and failed to recognize its responsibilities towards the bigger issues of national life."

I think your leading article sums up the case clearly, and the majority would agree that "the cobbler must stick to his

last"; it does not suggest that any influence should be brought to bear on any individual or group of members of the profession regarding their political opinions, as some of the correspondence against the leading article implies. Probably those best qualified to speak on economics will be found in the ranks of general practitioners and the country doctors; they have the day work and most of the night work to do, which possibly explains why they are generally silent on these matters; however, I feel it would be the general opinion that it is no concern of medicine to take part in economic or political affairs.—I am, etc.,

Exmouth, Feb. 3. FREDK. COCK.

SIR,—Several contributors have justly criticized your editorial regarding the obligations of the medical profession to state Man's minimum needs and to exert its influence under our democratic political system to get these satisfied. I wish particularly to support the plea of Dr. F. Dillon (January 25, p. 132) that politics be no longer regarded as only a plaything of political parties. Even the most extreme form of *laissez-faire* demands some sort of communal administration. Recent trends, however, show that in future, from necessity, more and more control of the activities of the community must be exercised by national and international Governments and legislatures. Are these to frame their policies according to reason and by scientific methods with full knowledge of the facts? Surely in our own province it is the duty of our profession, collectively and individually, to see that they do. An enormous amount of research is being carried on to rid mankind of the ravages of disease. But what facilities for research are provided for studying ways of curing these social and economic ills which are of far greater importance as destroyers of human well-being than disease? Such research ought to be carried out on a scientific basis independently of political parties with their fixed dogmas.

As an alternative to Hitler's New Order there has got to be offered a new system of democracy, purged of the inadequacies of the old and guaranteeing the minimum necessities of life to all. Only thus can democracy regain support in Europe. I should like to point out that there is already a movement, federal union, run on a non-party basis, advocating a European democratic system to replace that of Fascism. The federal Government that it contemplates would have powers and obligations to ensure that all citizens were guaranteed the minimum necessities of life, including medical attention, by making the satisfaction of these needs the first call on the resources of the community.—I am, etc.,

London, Feb. 5. D. G. FF. EDWARD.

Medical Planning Commission

SIR,—Since the announcement of the Commission in the *Supplement* of January 4 much correspondence upon the matter has appeared in the *Journal*. This correspondence reveals serious doubts about both the adequacy and representative character of this important body. These doubts have had particular reference to the preponderance of elderly members. These doubts may or may not be removed, but if we may judge from past experience of centralized committees it is safe to predict that the main part of the Commission's work will be done by a small group who are able to meet regularly. It is also safe to suppose that this group will be composed mainly of London members and of the older provincial members. Time and distance under war conditions will prevent the younger and more professionally active members from taking more than a perfunctory part in the proceedings.

We are told that the visions and aspirations of the younger men and women will not be overlooked. This sounds much more like a condescending gesture than an invitation to co-operation. Indeed, it suggests rather that it is the intention of the promoters that the Commission shall be dominated by the "less younger" of our colleagues.

The fear that the profession will be faced by a *fait accompli* has already been expressed. But even this is perhaps not the greatest danger. Surely the most serious result of an unrepresentative report is the deep division within the profession which it is likely to produce. The spectacle of a divided profession is not one likely to dispose Parliament to give that consideration to medical opinion which is desirable. Better no report than a disputed report. Is this now inevitable? One can but hope that it is not. Is it too late to urge the reorganization of the Commission on a regional basis? It is widely believed that a regional medical service has the best prospect of success, and in any event regional problems and conditions must be given full and knowledgeable consideration. Adequate representation, backed by the regular attendance of members, would be ensured, and an agreed report could be expected.

The suggestion is that seven or eight regional committees, preferably elected, would be set up, together with several special committees to deal with specific problems. These committees would work simultaneously according to an agreed programme, and report at regular intervals to a central body which would be composed of representatives of the committees together with an equal number of members nominated by such bodies as the Royal Colleges, the Medical Schools, and the B.M.A. The chairman could profitably be a wise and judicial layman. The function of this central body would be the progressive integration of the committee reports into a balanced whole. The widest publicity in the medical press throughout the proceedings is an essential feature.

It is considered that the less frequent meetings of this much smaller body need present no obstacle to regular attendance, especially if the provincial members were compensated for their time and their expenses defrayed, as indeed is only fair.

It is true that the B.M.A. has promised that Divisions and Branches "will have a chance to study and if necessary to criticize" the findings of the Commission. But if this is to be considered as a method of discovering and focusing the considered view of the profession on the vast problems under discussion, it is surely a *reductio ad absurdum in excelsis*. What Division or Branch, faced with a document of 300 or 400 pages, could adequately digest, let alone criticize, it within a reasonable time? And if they could, what effect are their several and possibly diverse critiques likely to produce? We all know the answer. Furthermore, not all the members of the profession are members of the B.M.A. or other bodies represented on the Commission as at present constituted.

We have a chance to mould a future National Medical Service. Let us not lose it.—I am, etc.,

Newcastle-upon-Tyne, Feb. 1. A. G. OGILVIE.

SIR,—It is with some disappointment that many of us have read the list of those whom the B.M.A. have selected to plan for the future of our profession. We did not expect that so many of what may be termed without disrespect "the old crowd" would be again called together to form the key personnel of this planning commission, whose decisions will be of such vital importance to most of us.

It is specifically mentioned that "much thought has been given to the age distribution of members of the commission." I have ventured therefore to determine this, so far as is possible from reference books. This research yields the following results: of the fifty-seven members whose names are given, seven appear to be over 70. There are six between 65 and 70; nine between 60 and 65; eighteen between 50 and 60; eighteen between 45 and 50; and eleven under 45.

Sincerely as I value the experience which a ripe maturity can contribute to most problems, I would venture to maintain that it is the "under forty-fives" who should be chiefly represented where the issue is the future environment in which they are to live their lives and practise their art after this war. We shall no doubt be told that "youth" will be further represented on the subcommittees; nevertheless I would suggest that it would be better to reverse the principle, and see to it that "age and experience" were adequately represented on the subcommittees, and that the main body of the Commission should represent an average age not higher than (say) 50 years.

A further point causes me some surprise. The medical personnel of the Forces must by now represent the largest form of State medical service in this country. I see no representation of this important new body of opinion, many of whom are perhaps more concerned as to what the future holds in store for them than are their colleagues who still remain in civil life. It seems certain that many of these men who now have experience of both civil and State-controlled medicine might have much to contribute to the deliberations

of such a commission in view of the rapid and enlightened development which is still taking place in this sphere. Many of them are contributing actively to this development. It would appear that the B.M.A. are themselves not yet fully aware of the extent of this, and I may perhaps be permitted to quote some recent words of Prof. F. A. E. Crew, F.R.S. (in the opening contribution to a discussion arranged by the Edinburgh Branch of the B.M.A.). He said: "When I look around the [Army] Medical Services as they are even now taking shape, I marvel at their comprehensiveness and their promise of completeness, at the simple beauty of their design and the efficiency of their functioning. And I am led to wonder whether we as a society can ever be content to let this organization disintegrate when the war ends."—I am, etc.,

Jan. 19. W. S. C. COPEMAN, M.D., F.R.C.P.

Tobacco and Symptoms of Duodenal Ulceration

SIR,—With regard to dyspepsia in the Army, which you have been discussing recently in your columns, I can from personal experience confirm the fact that one can have symptoms almost, if not quite, identical with those of duodenal ulcer and yet no ulceration be present.

There are a number of factors which contribute to the development of these symptoms in a soldier—nervous excitement, overwork and worry, diet, etc.—but there is one serious exciting and aggravating cause—namely, cigarette smoking. Before the French collapse a kind friend sent a million cigarettes to the troops in France, and I feel sure that most physicians would agree that a million glucose sweets or malted milk tablets would have been a much better gift, and could be made just as popular among friends. I think it a decided disservice to our men to encourage this cigarette smoking, which would not be tolerated in the case of athletes or when perfect training was desired, which it should be in the case of soldiers. We must not allow the apparent unkindness of depriving our gallant men of the comfort of their cigarette to blind us to the bigger and more important question of their highest physical fitness and welfare.

One final point: it is sometimes forgotten that belladonna is most valuable in relieving the spasm which is an underlying factor in these cases.—I am, etc.,

Ilford, Feb. 5. N. BEATTIE.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on February 4 an offer from Viscount Nuffield to give to the University £25,000 to encourage research in ophthalmology was gratefully accepted. Arising out of this, a decree was adopted authorizing the appointment of a research assistant to the Margaret Ogilvie Reader in Ophthalmology for a maximum of five years and at a salary not exceeding £600 a year, and providing money from the residue of the gift for accommodation, equipment, and staff. The duties of the person holding the new post will be to assist the Reader in researches, whether of a clinical nature or otherwise, into the causes and cure of diseases affecting vision, and if he is a medical practitioner he will be debarred from private practice while in office.

In Congregation on February 18, at 2 p.m., a statute will be brought forward declaring that a candidate for the degree of Bachelor of Medicine shall not be allowed to sit more than three times for the examination in human anatomy and human physiology in the First Examination for that degree without leave of the Board of the Faculty of Medicine. If the statute is approved a decree will be proposed that it shall not apply to any person matriculated before Hilary Term, 1941.

Dr. William Brown has been reappointed Wilde Reader in Mental Philosophy for five years from June 9, 1941.

The Theodore Williams Scholarship in Pathology, 1940, has been divided between M. P. Lewis, B.A., and R. G. Ladkin, B.A.

UNIVERSITY OF CAMBRIDGE

In Congregation on February 7 it was resolved that the First M.B. Examination shall begin on March 17 in the present term, and on October 2 in the Michaelmas term of this year.

The following medical degrees were conferred:

M.D.—*O. N. Roussel.

M.B., B.CHIR.—*W. B. D. Maile, *H. D. S. Vellacott, G. E. H. Enderby, D. N. White.

* By proxy.

During January the titles of the degrees of M.B., B.Chir. were conferred by diploma on P. G. Holman of Newnham College.

Congregations during the present term will be held on Saturday, March 1, and Friday, March 14, at 2 p.m.

The Services

D.D.M.S., SCOTTISH COMMAND

Brigadier J. A. Manifold, D.S.O., late R.A.M.C., has been selected for promotion to major-general on March 1, when he will take up the appointment of Deputy Director of Medical Services, Scottish Command. He will be succeeded as Director of Hygiene, the War Office, by Brigadier D. T. Richardson, *M.C.*, late R.A.M.C.

D.D.M.S., EASTERN COMMAND

Brigadier O. W. McSheehy, D.S.O., O.B.E., late R.A.M.C., has been selected for promotion to major-general on March 26, when he will take up the appointment of Deputy Director of Medical Services, Eastern Command. He will be succeeded as Deputy Director-General, Army Medical Services, the War Office, by Brigadier A. Hood, C.B.E., late R.A.M.C.

EFFICIENCY DECORATION

The King has conferred the Efficiency Decoration of the Territorial Army on Colonel John Elvin Rusby, M.C.; Lieut.-Colonels Joseph Alexander Bingham, David Justin Davies, and Maxwell Hamilton Summers; and Temporary Lieut.-Colonel David Saunders Jones.

MENTIONS IN DISPATCHES

Corrigenda

In the list of officers whose names have been brought to notice in recognition of distinguished services in connexion with operations in the field, March to June, 1940, published in the *Journal* of January 4, the name of Lieut. H. L. Connor, R.A.M.C., was omitted, and the initials of Major Y. Moore and Lieut. A. E. Burgess, R.A.M.C., should read Major J. Y. Moore and Lieut. W. M. Burgess, R.A.M.C.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Probationary Temporary Surgeon Lieut. CHARLES LEON PRETRE, R.N.V.R. (H.M.S. *Acheron*), is posted as "Missing, Presumed Killed" in an Admiralty Casualty List published on February 4. He qualified M.R.C.S., L.R.C.P. in 1939 and his home was at Dagenham.

Surgeon Lieut. GEOFFREY RAYMOND EDWARD MAXTED, R.N.V.R., died on active service in December, 1940, aged 26. He was the younger son of Dr. and Mrs. E. B. Maxted of Clifton, Bristol, and was educated at Bristol University, where he graduated M.B., Ch.B. in 1938.

Surgeon Lieut. ROBERT DUDLEY ROPER, R.N.V.R., has died suddenly, aged 34. He was the son of the late Dr. H. J. Roper, who died in 1938, and was educated at Cambridge University, where he graduated B.Chir. in 1933, and at St. Bartholomew's Hospital. He also took the M.R.C.S., L.R.C.P. in 1933 and the Cambridge M.B. two years later. He had held the posts of house-surgeon to the ear, nose, and throat department and resident anaesthetist at Charing Cross Hospital and casualty house-surgeon and clinical assistant to the skin department at St. Bartholomew's Hospital. Before the war he was honorary anaesthetist to Charing Cross Hospital, the Hospital of St. John and St. Elizabeth, and the Connaught Hospital.

ROYAL AIR FORCE

The death is announced, in January on active service, of Flying Officer ARTHUR RICHARD YATES of Sisland, near Loddon, Norfolk. He qualified M.R.C.S., L.R.C.P. in 1935. He leaves a widow and two children.

ROYAL ARMY MEDICAL CORPS

The name of Lieut. FRANCIS CUTHBERTSON MCLAREN is included as "Died" in an Army Casualty List published on January 31. He was the son of Mr. and Mrs. T. McLaren of Broughty Ferry and was educated at Glasgow University,

where he graduated M.B., Ch.B. in 1938. After filling the posts of house-surgeon at Victoria Infirmary, Glasgow, and junior assistant medical officer at the North Middlesex Hospital, London, he recently joined the R.A.M.C. He leaves a widow.

DEATHS IN THE SERVICES

Colonel ROBERT WILLIAM CLEMENTS, C.M.G., D.S.O., late R.A.M.C., died at Ootacamund, Southern India, on January 22, aged 70. He was born at Pomeroy, Co. Tyrone, on April 7, 1870, was educated at Queen's College, Galway, took the M.B., B.Ch., B.A.O. of the Royal University of Ireland in 1895, and the Cambridge D.P.H. and the Liverpool D.T.M. in 1906. Entering the Army as surgeon lieutenant in 1896, he became lieutenant-colonel in 1915, colonel in 1917, and retired in 1922. He served throughout the war of 1914–18 and was mentioned in dispatches five times, receiving the D.S.O. in 1917 and the C.M.G. in 1918. After retirement he settled in India.

Fleet Surgeon WILLIAM GORDON STOTT, R.N. (ret.), died at Aberdeen on February 5. He was educated at Aberdeen University, where he graduated M.B., C.M. in 1885, after which he entered the Royal Navy, becoming fleet surgeon in 1903.

Obituary

SIR WILLIAM HORROCKS

Sir LEONARD HILL sends the following appreciation of the late Sir William Horrocks:

As a member of the Army Medical Advisory Board I was associated with the late Colonel Horrocks under Sir Alfred Keogh, who was Director-General, A.M.S., when the Germans made their first gas attack in the last war and very nearly broke through the line. Means had to be taken at once to provide defence against gas. A German submarine had been lately captured in which muslin face masks were found, and at the instigation, as I was told, of the First Lord of the Admiralty (then Mr. Winston Churchill) the women of England were thereupon asked to make such masks. These obviously were no good; meanwhile Horrocks designed the flannel hood respirator, which covered the whole head and was fitted with eye-pieces and impregnated with suitable chemicals for absorbing gas. Breathing took place through the pores of the flannel. This respirator was used successfully until the box respirator could be designed and manufactured. So that no time might be wasted over official financial delay, Horrocks told me he had gone out and ordered the flannel on his own responsibility. He carried out very valuable work in initiating the Chemical Warfare Committee and in furthering generally the hygiene of the Army. His son was taken prisoner, and he told me a code had been prepared in case of need by which his son was able to communicate safely with him. Horrocks also told me that his work in Malta had made clear that Mediterranean fever was transmitted by goats' milk, and so brought about the means of prevention. Bruce communicated this discovery in England, and Horrocks felt strongly that credit had not been justly accorded to him. Up to his death he had continued to edit the *Journal* of the R.A.M.C. His services to the Army and to medical science were very great.

JAMES ALLAN, M.D., D.P.H.

Dr. James Allan, who died at his home in Roundhay, aged 88, was for half of his long life medical superintendent of St. James's Hospital, Leeds, and one of the best-known medical officers in the North of England. At the time of his appointment the Leeds Workhouse Infirmary, as it was then called, was insufficient in many respects. A complete transformation took place and room was gradually made for 1,200 patients, including 200 mental cases, while notable changes were made in the class and number of nurses and in the provision made for them. When he retired in 1925 an unusual honour was paid him by the unveiling of a tablet recording his manifold services as medical superintendent, and the late Lord Moynihan spoke in warm terms of his work, saying that tens of thousands of patients had passed through Dr. Allan's hands.

James Allan graduated M.A. at the University of Aberdeen in 1874, M.B., C.M., with honours, in 1877, and M.D. in 1880; twenty years later he took the Cambridge D.P.H. Before his appointment in 1881 to the post at Leeds he had been assistant medical officer at the Wandsworth Infirmary and house-surgeon and house-physician at the Northern Hospital, Liverpool. He was for many years an active and zealous member of the British Medical Association, joining it in 1882. He represented the Leeds Division at sixteen Annual Meetings, was honorary secretary of the Division for twenty-five years (1906–31), and chairman in 1932–3. His colleagues of the Yorkshire Branch of the Association elected him president in 1921: he was also a past-president of the Leeds and West Riding Medico-Chirurgical Society.

ANDREW SPROTT, M.B., C.M.

We regret to record the death on January 29 of Dr. Andrew Sprott from coronary thrombosis. He had been in failing health during the last twelve months, but his death came with painful suddenness to his many friends in Appleby and the surrounding district, where he was held in the highest esteem and universal affection.

Andrew Sprott came of an old Galloway family. He was born 74 years ago in Wigtownshire, where his father was a well-known farmer who died young, but not before his eldest son developed a knowledge and love of beasts, birds, and flowers surpassed by few, and, furthermore, a capacity for painstaking hard work, a patient zeal and understanding of his fellow men which made him beloved by all with whom he came in contact. He graduated M.B., C.M. at Glasgow University in 1887, and started his professional career in a large country practice as assistant to the late Dr. J. W. Fawcitt of Broughton-in-Furness, and between these two there sprang up a friendship and affection which lasted throughout life. He married his friend's sister, Annie, with whom he had an ideally happy life. He then proceeded to Glenridding, on the shores of Ullswater, where he carried on the wild country practice often under hazardous conditions, but where, also, he found occasional time for his favourite sport of fly-fishing. With the advent of a young family, he transferred his activities to Appleby, the county town of Westmorland. There he built up a large and successful practice (from which he retired three years ago) and a reputation as a good doctor of outstanding kindness and integrity. He was a man of great ability and courage, who spared no effort on behalf of his patients; he was painstaking in the establishment of the diagnoses of his cases, and followed up accurate diagnosis with up-to-date treatment. He had a vivid interest in modern methods and was never behind the times in spite of his fifty years of practice. During the war of 1914–18 he was responsible for the establishment of a Red Cross hospital in Appleby, of which he was the medical officer, eventually becoming county director of the British Red Cross Association. He also took a great interest in the St. John Ambulance Brigade. He was a member of the British Medical Association for thirty-three years.

On his retirement the people of Appleby and district made him a presentation on such a generous scale that he was positively embarrassed, and in his modest way he said to the writer, "I never expected or deserved this." He was a great gardener and a great botanist. His keen interest in botany was a source of joy which he shared with his wife, his daughter, and his invalid son, who died some eighteen months ago after fourteen years in bed as an indirect result of his service during the last war. His eldest son died on active service in Mesopotamia in 1917. He is survived by his widow, a daughter, and son who lives in the Far East.

Dr. ALEXANDER GUNN AULD, who died at the end of January in his eighty-first year, is likely to be remembered for his work on asthma, hay fever, migraine, and related diseases. From quite early days, alike in the laboratory and at the bedside, he made these topics his peculiar province, and

it was along a strict line of scientific inquiry that he reached the practice of what he named pyrogenic therapy—that is, the introduction of peptones and allied bodies into the blood stream. In his hands the practice had a large measure of success, and its value has been widely recognized by other workers. The record of Auld's researches and teaching is to be found in his book entitled *Asthma, Hay Fever, Migraine, and Allied Diseases*. It is with this contribution to practical therapeutics that his name is particularly associated. Personally his habit of mind was almost severely scientific and he cultivated philosophy and literary ambitions; for some years he was the editor of the *Medical Magazine*. His professional qualifications included M.D.Glasg., M.R.C.P.Lond., D.P.H. Oxon. He had been a member of the council of the London and Counties Medical Protection Society, and was for some years a lecturer on clinical medicine and pathology at the North London Postgraduate College.

The death occurred in January from enemy action of KERIDWEN ST. VALENTINE ARMSTRONG, M.D., D.P.H., while on duty for the Emergency Medical Service. She was the wife of Dr. J. V. Armstrong. Keridwen Edwards came to University College Hospital from Cardiff University in 1919, and so was among the first group of women students admitted to that hospital. She gained the Liston gold medal in surgery and qualified in 1921 shortly after her twenty-first birthday. After resident appointments at King Edward VII Hospital, Windsor, the Evelina Hospital for Children, Glan Ely Tuberculosis Hospital, Cardiff, and the ear, nose, and throat department of University College Hospital, she entered the L.C.C. Fever Hospital Service and was appointed to the Grove Hospital, Tooting. She spent a year at Queen Mary's Hospital for Children, Carshalton, before her marriage in 1934. That is her medical record, and certainly it indicates the length and breadth of her service as a doctor. Her friends, however, will find interest and comfort in the fact that the war which has now taken her life gave her opportunity to practise that particular branch of medicine which had always appealed to her as her especial vocation at the outset of her career. The hospital of which her husband is the medical superintendent was incorporated into the Emergency Medical Service, and her part within that organization was with the orthopaedic unit. She was thus able to use and develop her talents in a sphere where she was most conscious of her skill. Mrs. Armstrong had, however, a place among her friends which even surpassed her place in her profession. She first appeared as a pretty and eager young woman, younger than her contemporaries and challenging in her outlook. To immature medical students the challenge was at first disconcerting, but her charm and her mental integrity, as well as her competence, yielded to her all the sweet awards of work and friendship. And those qualities which showed themselves when she came from Wales and joined her fellow students at U.C.H. persisted throughout her life. Her death has broken a partnership which cemented two careers. The happiness of her married life, which delighted their many friends, served their work and gave benefit to all who knew them or were in their care.

The death occurred in January from enemy action of WINIFRED PORTER, M.B., Ch.B.Vict. Born in Leigh in 1909, she began her medical studies at Manchester in 1928. After qualifying in 1934 she had been house-physician to the South London Hospital and Victoria Hospital, Chelsea, and later resident medical officer to the Princess Louise Hospital. She was also resident medical officer to the Convalescent Home, Swanley. Dr. Porter was showing great promise as a psychiatrist, having studied her specialty at the Maudsley Hospital and later at the Retreat, in Yorkshire, from where she went to Cane Hill Hospital, Coulsdon. She had a very high reputation among the staff, being possessed of keen clinical acumen and marked practical ability. A colleague writes: The death of Dr. Winifred Porter has deprived the medical profession of a very promising young psychiatrist. She was a woman of exceptional intelligence and charm, beloved by colleagues and patients alike. In her work she was efficient and always to be relied on in an emergency. As an anaesthetist she was outstanding, and had a high reputation among the hospital staff and consultants. She had a sharp clinical acumen and a marked proficiency at getting straight to the core of any matter in hand. She always had the good of her patients at heart, and took a particular interest in the welfare of the nursing staff in her wards. Dr. Porter was a great lover of the truth and fearless in the expression of her opinions when she felt them justified. She was a true champion of the cause of liberty and would unhesitatingly have sacrificed her life if she had thought the cause would benefit. As it is her death is one more example of the cruel barbarism of indiscriminate bombing, which can gain our enemies nothing and only serve to steel us to endure to the end. Dr. Porter was engaged to Surgeon Lieut. K. O'Connor, R.N., and to him and her parents all those of us who knew her sterling worth tend our heartfelt sympathies.

We regret to announce the death in his eighty-eighth year of Sir JOHN MCFADYEAN, LL.D., formerly Principal of the Royal Veterinary College, who was vice-president of the Section of Pathology when the British Medical Association held its Annual Meeting in Edinburgh in 1898. His death removes one of the pioneers who built up veterinary science and changed the status of veterinary medicine. A native of Wigtownshire, he was born on June 17, 1853, and after training at the Edinburgh Veterinary College took the M.R.C.V.S. in 1876. Thereupon he entered as a medical student, graduating M.B., C.M.Ed. in 1882 and B.Sc. in the following year, and became lecturer on anatomy and pathology at the Edinburgh Veterinary College. His next post was that of dean of the Royal Veterinary College in Camden Town, London; when the chair of comparative pathology was established there he was appointed to it, and he served as Principal from 1894 to 1927. McFadyean edited the *Journal of Comparative Pathology and Therapeutics* for many years. With his medical and veterinary qualifications and his belief in the future of comparative medicine it was most appropriate that he should be invited to hold office at the Edinburgh Annual Meeting of the B.M.A. He was knighted in 1905 and the University of Aberdeen conferred its honorary LL.D. upon him.

Medical Notes in Parliament

Mr. James Griffiths has given notice that when the House goes into Committee on the Civil Estimates he will call attention to deficiencies of the National Health Insurance Act and move a resolution.

War Damage Bill

During the consideration of the War Damage Bill on February 5, Clause 29 (Property held for Charitable Purposes) was amended, on the motion of Mr. CHARLES WILLIAMS, to cover specifically any properties engaged in "the making of provision for the cure or mitigation or prevention of, or for the care of persons suffering from or subject to, any disease or infirmity or disability affecting human beings (including the care of women before, during, and after childbirth)." He said the amendment was to make clear that provisions for these women came under the Bill.

On Clause 42 (Insurance Schemes) Sir FRANCIS FREMANTLE moved on February 5 that "business" in this part of the Bill should include "any trade, profession, employment, or vocation." He said he was concerned to include in "profession" medical men. It was thought by the medical profession that it would be best to use the interpretation of the word "business" which was used in the Income Tax Act. The memorandum in the Bill said the word "business" did include professions, but there was nothing in the Bill to say so. Mr. LYTTLETON said the word "business" covered the professions, and to introduce the words proposed by Sir Francis would legally be dangerous. Sir Francis withdrew the proposed amendment.

Medical Man-power

Mr. MANDER asserted on February 14 that widespread dissatisfaction at present existed in the medical profession with regard to the failure to utilize to the fullest extent the services of the medical profession in the national effort, owing

to lack of co-ordination and co-operation between the Emergency Medical Service, the medical services of the armed Forces, and the general body of civilian medical practitioners. He asked Mr. MacDonald to consider appointing a small non-medical committee to investigate the most effective organization for utilizing to the best advantage the medical services of the country Mr. MACDONALD replied that the Service Ministers, the Secretary for Scotland, and he were not aware of any widespread dissatisfaction, but recently had the advice of a committee appointed to consider the steps necessary to secure a proper allocation of the available medical manpower between civilian and military services. The committee consisted of Sir Arthur Robinson, as chairman, and three medical men with wide experience of the various branches of the profession—namely, Sir John Fraser, Sir Kaye Le Fleming, and Prof. R. M. F. Picken. Their report was now receiving the active consideration of these Ministers.

Mr. MANDER offered to supply evidence of dissatisfaction.

Mr. WOODBURN asked Mr. MacDonald to induce the medical profession to relinquish some of its trade-union etiquette so that its work should be better spread over the population.

Butter Ration of Tuberculous Persons.—On February 11 Mr. PARKER asked the Parliamentary Secretary to the Ministry of Food whether a larger ration of butter could be provided for patients suffering from tuberculosis, as the present two ounces was insufficient for nourishment purposes. Major LLOYD GEORGE said that the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council was considering the position of invalids, including tuberculous patients, in the light of the present food restrictions.

Medical News

The Hospital for Sick Children, Great Ormond Street, would like members of the medical profession to know that through the kind co-operation of the Watford Peace Memorial Hospital it has been found possible, as a wartime measure, to open consultative out-patient clinics there. At first clinics will be held once a week, beginning on Friday, March 7. Medical and surgical cases should attend at 10 a.m. and ear, nose, and throat cases at noon. These clinics will be extended later if necessary. The clinics will be conducted by members of the visiting medical staff of the Hospital for Sick Children, and new cases must be recommended by a doctor. Appointments should be made by letter through: The Almoner to the Hospital for Sick Children Clinic, Watford Peace Memorial Hospital, Watford, Herts.

The University of Manchester has arranged a week-end course on factory medical services for medical practitioners. It will be held on Saturday and Sunday, March 1 and 2, and the fee is one guinea. Full details of the course may be had from the Director of Extramural Studies, The University, Manchester, 13.

Surgeon-General Thomas Parran, of the United States Public Health Service, will be entertained at luncheon by the Society of Medical Officers of Health on Friday, February 21, at the Piccadilly Hotel, W., at 12.45 for 1 p.m. Tickets (7s. 6d., including wine and gratuities) are obtainable by members of the Society from the acting Executive Secretary at Tavistock House South, Tavistock Square, W.C.1, not later than February 19. Members may be accompanied by one representative of their local authority.

A meeting of the Shaftesbury Military Hospital Medical Society will be held at the hospital on Tuesday, February 18, when Colonel L. E. H. Whitby will give an address on "Transfusion for War Conditions."

The Medical Women's Federation is arranging a course of six lectures on social anthropology to be given at the London School of Hygiene and Tropical Medicine from March 3 to 8 at 4.30 p.m. It is intended mainly for doctors and nurses working over-seas, but members of the public will be welcome. Fee for the course is 1½ guineas, with a reduction for missionaries. Tickets and further information may be obtained from Dr. Margaret Balfour, 14, Sylvan Road, Upper Norwood, S.E.19, or at the first lecture.

A meeting of the Faculty of Radiologists will be held at 32, Welbeck Street, W., on Friday, February 21. At 10.30 a.m. the Therapy Section has arranged a discussion on "The Organization of Radiotherapy in Wartime," to be opened by Mr. Malcolm Donaldson, followed by Mr. E. Rock Carling, Mr. G. F. Stebbing, and Dr. Ralston Paterson; at 2 p.m. the Skinner Lecture on "Cancer of the Bladder" will be delivered by Dr. Ralston Paterson; and at 3 p.m. before the Diagnostic Section there will be a demonstration on "The Anatomy and Radiology of the Bronchial Glands," by Dr. Stefan Engel. A discussion will follow. Copies of the report of the discussion on the organization of radiotherapy in wartime will be available to members in due course at a cost of 2s. each. Members requiring copies should apply to the secretary.

Applications are invited for Leverhulme fellowships or grants in aid of research, intended for senior workers who are prevented from carrying out research work by routine duties or pressure of other work. The trustees are also prepared to consider applications from groups of workers engaged upon co-operative programmes of research, particularly from those engaged upon long-distance programmes or in institutions in which the normal facilities for research have been curtailed by the war. Forms of application, returnable by March 1, may be had from Dr. L. Haden Guest, M.P., Kinscote House, 1, Watergate, Blackfriars, London, E.C.4.

Diabetics, who already have triple rations of butter and margarine, are now to have a triple meat ration; information to this effect has been sent to local food committees. The Ministry of Health has recently emphasized the need for those who regularly take insulin, and who therefore would run special risks should they become air-raid casualties, to carry on their persons some indication that they are diabetics. They can obtain from the Diabetic Association, 124, Baker Street, London, W.1, on receipt of a stamped addressed envelope, a suitable card for carrying inside their identity card on which can be written the usual dose of insulin, the treatment for an overdose, and their medical adviser's name and address.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

During the week under review there were increases in the incidence of cerebrospinal fever, enteric fever, and pneumonia (primary and influenzal) in England and Wales and in Scotland, where increases in notifications of measles and whooping-cough were also recorded, but these may be due rather to an extension of the system of notification or "intimation" than to an actual high increase.

Influenza for Week Ending February 1

The return of influenza deaths for the week ending February 1 for the 126 great towns, 176, again almost precisely repeats the figures of 1929; in that year we had 99, 122, 179, and, in this year, 99, 120, 176. At first sight this is ominous, for in 1929 influenza became very severe. But in that year 99 was reached a fortnight earlier, and time is an important element. In general, the later a recrudescence begins the less likely is it to reach severe proportions. The most recent returns for London show a reduction in the numbers of daily admissions to hospital of cases of influenza, bronchitis, and pneumonia cases. It now appears probable that there will not be a sudden great rise in influenza deaths, but mortality is likely to continue to increase. The age distribution of the deaths is of the normal type. 56% are at ages over 65 and 5% at ages under 25. In the corresponding week for 1939 deaths from influenza numbered 210, and, for 1940, 353.

Total of Influenza Deaths and Deaths in Age Groups in 126 Great Towns for Week Ending February 1

All Ages	A Under 1 year	B 1-5	C 5-15	D 15-25	E 25-35	F 35-45	G 45-55	H 55-65	I 65-75	J 75 and over
176	5	—	—	4	7	10	18	33	53	46

Regional Totals of Influenza Deaths for Week Ending February 1

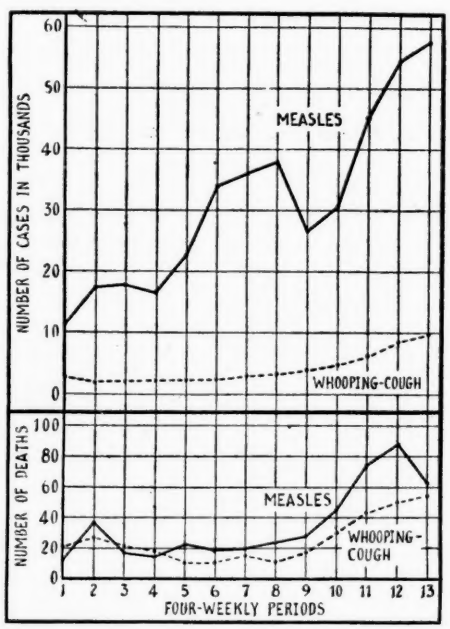
South-Eastern Area:		Midland Area	23
Greater London .. 86 } =	100	Eastern Area	2
Rest of S.E. .. 14 }		South-Western Area	4
Northern Area	56	Wales and Monmouthshire ..	5
		Total for 126 Great Towns including the Outer Ring	190

Cerebrospinal Fever

The incidence of cerebrospinal fever has been increasing and it is more prevalent than last year (266 notifications as against 107); a steep rise was then noted in the last week of January and the peak reached in the week ended March 2; the decline of the epidemic was much more leisurely and more irregular than its rise. With prompt diagnosis and adequate treatment the case fatality rarely exceeds 5%. The number of administrative health areas affected rose from forty-one to forty-four, in eighteen of which more than 5 cases were recorded—namely, Lancaster 46, Yorks, West Riding, 22, Warwick 19, Gloucester 14, London 14, Glamorgan 12, Wiltshire 9, Southampton 8, Surrey 8, Durham, Essex, and Kent 7 each, Derby, Middlesex, Northampton, Nottingham, Yorks, North Riding, and Monmouth 6 each. The notifications for the week ending February 1 (just received) were 326.

Measles and Whooping-cough.—The fall in the incidence of measles and whooping-cough, which remain by far the most prevalent acute infectious diseases in this country, and the generally low case fatality of both diseases are gratifying in view of the abnormal conditions under which many of those at risk are living.

During 1940, as the accompanying graph shows, measles steadily gained ground; a marked decline occurred in the four weeks August 3 to August 31, which is probably due to extrinsic factors rather than to changes in the virulence or dispersal potential of the causative organism. This fluctuation in the epidemic curve found no counterpart in the deaths in the principal towns. Despite the increase of the disease and the prevalence of catarrhal infections, measles proved less fatal towards the end of the year; there has been a tendency towards a higher case fatality in recent weeks, but exact observations are impossible as returns for deaths are available only for the principal towns. The uniform low curve of whooping-cough is in sharp contrast to that of measles. Concurrent respiratory infections are of less moment in measles than in whooping-cough, which is a mild disease in summer and deadly in winter. Measles is potentially dangerous to the young at any season, but in recent years has been remarkably mild, for which a complete explanation is not yet forthcoming. Improved nutritional standards, increased facilities for home nursing and hospital treatment, probably all play their part.



Graph showing cases of and deaths from measles and whooping-cough in the thirteen four-weekly periods in 1940 (cases for England and Wales and deaths in the 126 principal towns).

No. 2

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended January 11, 1941.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash—denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	1941 (b)	1941 (c)	1941 (d)	1941 (e)	1940 (Corresponding Week) (a)	1940 (b)	1940 (c)	1940 (d)	1940 (e)
Cerebrospinal fever	266	14	49	1	12	107	5	23	8	—
Deaths		1	1				3	—		
Diphtheria	1,233	40	377	21	35	745	27	204	65	48
Deaths	43	3	16	1	1	17	—	5	1	1
Dysentery	93	8	33		—	31	3	13		—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	2	—	—		—	8	—	—		—
Deaths		—	—				—	3		
Enteric (typhoid and paratyphoid) fever	30	3	4	3	1	11	1	2	7	4
Deaths	—	—	—	—	—	—	—	—	—	—
Erysipelas		23	68	7	7			67	8	7
Deaths		—	—				—	1		
Infective enteritis or diarrhoea under 2 years										
Deaths	36	4	11	4	1	32	3	11	5	3
Measles	15,413	440	353*		11	2,740	33	27		278
Deaths	23	1	5	1	—	1	—	1	2	3
Ophthalmia neonatorum	73	1	8		—	66	9	15		1
Deaths										
Pneumonia, influenzal†	1,465	79	24	7	11	1,457	99	63	12	9
Deaths (from influenza)	69	9	8	6	1	158	14	38	2	7
Pneumonia, primary			268	57				545	17	
Deaths		74		15	9				19	6
Polio-encephalitis, acute	—	—				4	—			
Deaths		—					—			
Poliomyelitis, acute	5	—	6	—	—	6	—	—	—	—
Deaths		—	—				—	—		
Puerperal fever	—	—	13	2	—		4	7	8	1
Deaths		1					1‡			
Puerperal pyrexia	119	—	14		2	159§	7	12		1
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,164	77	174	47	46	1,141	38	154	64	84
Deaths	1	—	—	—	—	1	—	1	—	1
Small-pox	—	—	—	—	—	1	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	2,761	30	320*		31	787	22	23		14
Deaths	22	2	14	3		5	—	—	—	—
Deaths (0-1 year)	484	39	96	39	16	415	62	96	37	22
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	7,251	1,026	1,034	284	189	8,269	1,530	1,215	312	174
Annual death rate (per 1,000 persons living)			22.5	18.9	16.6			24.6	20.8	15.3
Live births	5,418	333	922	316	223	6,663	2,049	902	339	263
Annual rate per 1,000 persons living			18.7	21.0	19.5			18.3	22.6	23.1
Stillbirths	217	13	42			259	29	50		
Rate per 1,000 total births (including stillborn)			44					53		

* Notification in certain administrative areas only.
† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.
‡ Death from puerperal sepsis.
§ Includes figures for puerperal fever.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Treatment of Psoriasis

"S. A." would like some advice on the treatment of psoriasis, especially by hormones. A case in a young girl has responded well to stilboestrol. Would it be wise to apply the same treatment to a young male? Suggestions as to external applications would be welcome.

Bismuth Hair Dye

"S. S. V." writes: What is a good formula for using bismuth as a hair dye? The proprietary preparations on the market are costly. A cheap and efficacious formula will be appreciated.

Treatment of Snoring

Dr. G. KEPPIE PATERSON (Edinburgh) writes in reply to Dr. George Macdonald (February 1, p. 182): Snoring is due to the tongue falling back on the back wall of the pharynx. It is aggravated or produced by the head being bent forward on the chest. The way to avoid it is to turn the head to one side and raise the chin as far up as can comfortably be done. A hollow should be dumped in the pillow for the back of the head to rest in. It is better to discard the pillow and lie on a bolster. I was led to this knowledge many years ago by reading an article in the *B.M.J.* on investigation of cadavers by making an opening from the back of the neck into the pharynx, and the tongue had never fallen back when the head was adjusted in this way. At the time I was acting as chloroformist in a large number of abdominal sections, and snoring in those days was to be carefully avoided. I found this plan very effective.

Diphtheria Incidence: A Small-pox Analogy

Dr. ROBERT ANDERSON (Birmingham) writes: Dr. C. Killick Millard (February 1, p. 182) does not consider it safe to argue from the individual to the community in the case of vaccination. I do not agree. If 400,000 revaccinated people (half the community) show a 100% freedom from attack in a subsequent epidemic it is reasonable to suppose that, if the other half of the community had also been revaccinated, there would have been no epidemic the following year. If I do not wear my gas mask during a gas attack the fact that all my neighbours are doing so will not protect me.

Prevention of Herpes Labialis

Dr. R. F. PRICE (Forest Gate, E.7) writes in reply to "H. A." (February 1, p. 182): From personal experience I have found that spt. vini rect. applied to the area on the lip as soon as slight irritation is felt or as soon as the first sign of a "bleb" appears, and reapplied at frequent intervals for a few hours, usually entirely aborts the development of the herpes; and in cases where it has developed, the same application shortens the course of the condition as well as relieves the discomfort. Possibly the use of spt. vini rect. also tends to prevent recurrence, as I have had far fewer attacks of even incipient herpes since using this application.

Prof. H. GORDON CAMPBELL writes from the Dundee Dental Hospital and School (2, Park Place, Dundee): "H. A." (February 1, p. 182) may be interested in a letter from me published in the *Lancet* of December 21, 1940, p. 796. This letter contains an account of a severe case of "blisters on the lip" which had been continuous for four to five months. On August 24 and 25, 1940, I gave the patient 250 mg. of nicotinic acid (Roche)—during each forenoon, 150, and each evening 100 mg. The blisters had completely disappeared the following day, the 26th—that is, about fifty hours or so after the first dose of nicotinic acid had been administered. The patient then took 100 mg. of nicotinic acid daily for one week and then 50 mg. daily for a subsequent week. I saw the patient quite recently, and she has had no sign of any recurrence of the blisters and looks "another woman" in every way. Since this case I have had similar results in four other patients. I would recommend "H. A." to warn his patient about the customary "flushing" and feeling of itchiness which usually accompany the taking of such a dose of nicotinic acid. These signs appear to last for about half an hour the first day and about half that time the second day. They generally appear on the face, scalp, neck, and shoulders. I would be glad to hear from "H. A." and any others if they obtain similar successful results.

LETTERS, NOTES, ETC.

Local Application of Cod-liver Oil for Colds

Dr. W. PRIDHAM-WIPPELL (Thorverton) writes: Recent articles dealing with the prophylaxis of throat infection and oral and nasal personal antisepsis tempt me to suggest a simple method which I have used for some time with encouraging success in preventing, aborting, and relieving the "common cold." This consists of the instillation into each nostril of a pure unadulterated medicinal cod-liver oil. For prophylaxis—with the head thrown well back, half the contents of an ordinary fountain-pen filler (which holds about 2 c.cm. of oil) gently inserted into the anterior nares, is allowed to run in till it is felt to trickle down the back of the throat. This is followed by a slight increase of secretion, which should be wiped and not "blown" away. Carry out this procedure once in forty-eight hours, as the oil film seems to persist for that length of time. For a threatened coryza, where there are post-nasal soreness, tickling, and sneezing, a similar instillation twice a day will very often abort it. In the fully developed stage with much secretion and nasal blocking an instillation every four or six hours (with a light pledget of cotton-wool in the nostrils for a few minutes to absorb the increased secretion) relieves the symptoms and frequently shortens the progress of the attack. If the infection has spread further and laryngeal soreness and substernal tightness and rawness are complained of, other remedies are called for in addition. Personally, with the fully developed coryza, I do not wait for this stage but give the old-fashioned tinct. benzoini co. and creosote along with the local treatment.

Coeliac Disease

Dr. H. J. VAN PRAAGH writes: I was very interested in the article by Dr. John F. O'Sullivan and Prof. Henry Moore on coeliac disease (February 8, p. 183). This complaint was described in children under the name of acholia by Dr. W. Cheadle of St. Mary's Hospital in 1900. I was his house-physician at the time, and the treatment then in vogue was a low-fat diet and such drugs as mercury and arsenic. It may be of interest to note that in an article by myself in the *Lancet* in 1904 I observed early circulatory symptoms in an obstinate case in private practice, and pointed out that appropriate treatment of these symptoms cut short the attacks and eventually cured the patient without the use of any drugs—a useful commentary on the value of general treatment in these days of reliance upon synthetic and often dangerous remedies.

Tourniquet for First Aid

Capt. CYRIL D. FARRIS, R.A.M.C., writes: Apropos the recent correspondence in your *Journal* on the above subject, I have found that strips about 1 inch wide cut from a discarded inner tube of a motor-car make most excellent tourniquets, and have the great advantage of being made of a material which is universally available and may be had for the asking from any garage in the neighbourhood. As medical officer to a large number of searchlight sites scattered over a wide area, I felt the risk of a serious haemorrhage was a very real one, but since these have been issued I feel the danger has been largely overcome. There has been only one case of haemorrhage since they were issued, when the radial artery was severed, and in this case the tourniquet was applied by a quite unskilled man with extremely satisfactory results, and I therefore thought you might like to bring it before the notice of others of your readers.

Disclaimer

Dr. A. GUIRDHAM writes: An article under my name appears in the *World Digest* for March, 1941. The title of this article was changed without consulting me. The title of the original article from which the *World Digest* article was condensed was "Social and Economic Factors in Disease." The heading in *World Digest* is "Ulcers, Gout, and Capitalism." This gives an immediate political twist to what was essentially a non-political article by a person with not the remotest allegiance to any political party.